EBERLINE SERVICES

0059641

April 26, 2003

Mr. Steve Trent
Fluor Hanford Inc.
825 Jadwin Avenue
Richland, WA 99352

Reference: **P.O. #630**
Eberline Services R3-03-053-7453, SDG H2098

Dear Mr. Trent:

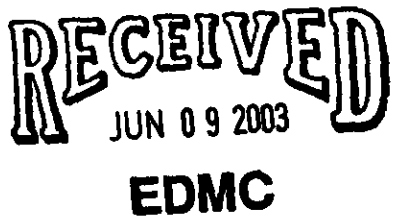
Enclosed is the data report for one solid sample designated under SAF No. F03-003 received at Eberline Services on March 13, 2003. The sample was analyzed according to the accompanying chain-of-custody document.

Please call if you have any questions concerning this report.

Sincerely,

Melissa Mannion

Melissa C. Mannion
Program Manager



MCM

Enclosure: Data Package

Analytical Services
2030 Wright Avenue
P.O. Box 4040
Richmond, California 94804-0040
(510) 235-2633 Fax (510) 235-0438
Toll Free (800) 841-5487
www.eberlineservices.com

1.0 GENERAL

Fluor Hanford Inc. (FH) Sample Delivery Group H2098 was composed of one solid (soil) sample designated under SAF No. F03-003 with a Project Designations of: 200 Area Source Characterization 200-CS-1 OU – Soil Sampling. The sample in SDG H2098 (Group R303053-7453) was batched with the samples in SDG H2093 (Group R303039-7451).

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analyses

No problems were encountered during the course of the analyses.

2.2 Tritium Analyses

The H-3 matrix spike recovery was 87%. The matrix spike is associated with a sample in SDG H2093 (Group R303039-7451). No problems were encountered during the course of the analyses.

2.3 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

2.4 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.5 Technetium-99 Analyses

No problems were encountered during the course of the analyses.

2.6 Isotopic Thorium Analyses

No problems were encountered during the course of the analyses.

2.7 Isotopic Uranium Analyses

Per FHI's instructions, the sample in SDG H2098 was not analyzed for isotopic uranium (see attached e-mail dated April 15, 2003).

2.8 Total Uranium Analyses

No problems were encountered during the course of the analyses.

2.9 Neptunium-237 Analyses

The LCS percent recovery (75%) was below the laboratory protocol limits (80 to 120%), but within the FHI contract limits (70 to 130%). No other problems were encountered during the course of the analyses.

2.10 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.11 Americium-241 Analyses

No problems were encountered during the course of the analyses.

2.12 Gamma Spectroscopy Analyses

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Melissa Mannion — 4/26/13

Melissa C. Mannion
Program Manager

Date

"Trent, Stephen J" <Stephen_J_Trent@RL.gov>
04/15/2003 04:41 PM

To: "Melissa Mannion (E-mail)" <mmannion@eberlineservices.com>
cc:
Subject: FW: F03-003: SDGs H2093, H2098, and H2101 total U

Melissa,

It looks like we can cancel the isotopic analyses on the samples associated with the cited SDGs.

Steve
-----Original Message-----
From: Cearlock, Christopher S
Sent: Tuesday, April 15, 2003 4:02 PM
To: Trent, Stephen J
Subject: RE: F03-003: SDGs H2093, H2098, and H2101 total U

Don't need any additional analysis for these SDGs.

> -----Original Message-----
> **From:** Trent, Stephen J
> **Sent:** Tuesday, April 15, 2003 2:39 PM
> **To:** Cearlock, Christopher S
> **Subject:** F03-003: SDGs H2093, H2098, and H2101 total U
>
> Chris,
>
> Please find attached the preliminary total U data for SDGs H2093, H2098, and H2101. Let me know at your earliest convenience whether you need the lab to perform an isotopic analysis on any of the associated samples.
>
> Thanks,
>
> Steve Trent
> Sample Management Project Coordinator
> Fluor Hanford - Central Plateau Project
> Ph: (509) 373-5869
> EFax: (866) 252-5816
> Site Pager: 85-7344

E B E R L I N E S E R V I C E S / R I C H M O N D
SAMPLE DELIVERY GROUP H2098

SDG	7453
Contact	Melissa C. Mannion

Client	Hanford
Contract	No. 630
Case no	SDG H2098

S U M M A R Y D A T A S E C T I O N

T A B L E O F C O N T E N T S

Melissa Mannion
Prepared by

Melissa Mannion
Reviewed by

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-TOC
Version	3.06
Report date	04/26/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2098

SDG 7453
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H2098

ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 04/26/03

SDG 7453
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG_H2098

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 04/26/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2098

LAB SAMPLE SUMMARY

SDG 7453
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H2098

LAB SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
R303039-05	Lab Control Sample		SOLID		F03-003		
R303039-06	Method Blank		SOLID		F03-003		
R303039-09	Lab Control Sample		SOLID		F03-003		
R303039-10	Method Blank		SOLID		F03-003		
R303053-01	B16541	Borehole B8828 100-102ft	SOLID		F03-003	F03-003-155	03/11/03 10:45
R303053-02	Duplicate (R303053-01)	Borehole B8828 100-102ft	SOLID		F03-003		03/11/03 10:45
R303053-03	Spike (R303053-01)	Borehole B8828 100-102ft	SOLID		F03-003		03/11/03 10:45
R303053-04	Duplicate (R303053-01)	Borehole B8828 100-102ft	SOLID		F03-003		03/11/03 10:45

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LS
Version 3.06
Report date 04/26/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2098

QC SUMMARY

SDG 7453
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H2098

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	DAYS SINCE COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7451		Method Blank	SOLID						R303039-06	7451-006
		Method Blank	SOLID						R303039-10	7451-010
		Lab Control Sample	SOLID						R303039-05	7451-005
		Lab Control Sample	SOLID						R303039-09	7451-009
7453	F03-003-155	B16541	SOLID	95.2	662.3 g		03/13/03	2	R303053-01	7453-001
		Duplicate (R303053-01)	SOLID	95.2	662.3 g		03/13/03	2	R303053-02	7453-002
		Duplicate (R303053-01)	SOLID	95.2	662.3 g		03/13/03	2	R303053-04	7453-004
		Spike (R303053-01)	SOLID	95.2	662.3 g		03/13/03	2	R303053-03	7453-003

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 04/26/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2098

PREP BATCH SUMMARY

SDG 7453
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H2098

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
AM	SOLID	Americium 241 in Soil	7043-127	5.0	1			1	1	1/1		
NP	SOLID	Neptunium in Soil	7043-127	5.0	1			1	1	1/1		
PU	SOLID	Plutonium, Isotopic in Solids	7043-127	5.0	1			1	1	1/1		
TH	SOLID	Thorium, Isotopic in Soil	7043-127	5.0	1			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Soil	7043-127	10.0	1			1	1	1/1		
TC	SOLID	Technetium 99 in Soil	7043-127	10.0	1			1	1	1/1		
Gas Proportional Counting												
93A	SOLID	Gross Alpha in Soil	7043-127	20.0	1			1	1	1/1		
93B	SOLID	Gross Beta in Soil	7043-127	15.0	1			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	7043-127	15.0	1			1	1	1/1		
Kinetic Phosphorimetry												
U_T	SOLID	Uranium, Total in Soil	7043-127	9.0	1			1	1	1/1		
Liquid Scintillation Counting												
H	SOLID	Tritium in Soil	7043-127	10.0	1			1	1	1/1		
NI_L	SOLID	Nickel 63 in Soil	7043-127	10.0	1			1	1	1/1	1/1	

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.
Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 04/26/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2098

LAB WORK SUMMARY

SDG 7453
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H2098

LAB SAMPLE COLLECTED RECEIVED	CLIENT SAMPLE ID LOCATION CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
R303039-05	Lab Control Sample			7451-005	93A/93		04/10/03	04/25/03	MCM	Gross Alpha in Soil
			SOLID	7451-005	93B/93		04/10/03	04/25/03	MCM	Gross Beta in Soil
		F03-003		7451-005	AM		04/07/03	04/25/03	MCM	Americium 241 in Soil
				7451-005	GAM		04/03/03	04/25/03	MCM	Gamma Scan
				7451-005	H		04/17/03	04/25/03	MCM	Tritium in Soil
				7451-005	NI_L		04/17/03	04/25/03	MCM	Nickel 63 in Soil
				7451-005	NP		04/10/03	04/25/03	MCM	Neptunium in Soil
				7451-005	PU		04/03/03	04/25/03	MCM	Plutonium, Isotopic in Solids
				7451-005	SR		04/03/03	04/25/03	MCM	Total Strontium in Soil
				7451-005	TC		04/15/03	04/25/03	MCM	Technetium 99 in Soil
				7451-005	TH		04/03/03	04/25/03	MCM	Thorium, Isotopic in Soil
R303039-06	Method Blank			7451-006	93A/93		04/09/03	04/25/03	MCM	Gross Alpha in Soil
			SOLID	7451-006	93B/93		04/09/03	04/25/03	MCM	Gross Beta in Soil
		F03-003		7451-006	AM		04/07/03	04/25/03	MCM	Americium 241 in Soil
				7451-006	GAM		04/03/03	04/25/03	MCM	Gamma Scan
				7451-006	H		04/17/03	04/25/03	MCM	Tritium in Soil
				7451-006	NI_L		04/17/03	04/25/03	MCM	Nickel 63 in Soil
				7451-006	NP		04/10/03	04/25/03	MCM	Neptunium in Soil
				7451-006	PU		04/03/03	04/25/03	MCM	Plutonium, Isotopic in Solids
				7451-006	SR		04/03/03	04/25/03	MCM	Total Strontium in Soil
				7451-006	TC		04/14/03	04/25/03	MCM	Technetium 99 in Soil
				7451-006	TH		04/03/03	04/25/03	MCM	Thorium, Isotopic in Soil
R303039-09	Lab Control Sample			7451-009	U_T		04/07/03	04/15/03	MCM	Uranium, Total in Soil
			SOLID							
		F03-003								
R303039-10	Method Blank			7451-010	U_T		04/07/03	04/15/03	MCM	Uranium, Total in Soil
			SOLID							
		F03-003								

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 04/26/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2098

SDG 7453
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract No. 630
Case no SDG H2098

LAB SAMPLE / COLLECTED / RECEIVED	CLIENT SAMPLE ID / LOCATION / CUSTODY	MATRIX / SAF No	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
R303053-01	B16541		7453-001	93A/93		04/10/03	04/26/03	MCM	Gross Alpha in Soil
03/11/03	Borehole B8828 100-102ft	SOLID	7453-001	93B/93		04/10/03	04/26/03	MCM	Gross Beta in Soil
03/13/03	F03-003-155	F03-003	7453-001	AM		04/07/03	04/26/03	MCM	Americium 241 in Soil
			7453-001	GAM		04/11/03	04/26/03	MCM	Gamma Scan
			7453-001	H		04/18/03	04/26/03	MCM	Tritium in Soil
			7453-001	NI_L		04/17/03	04/26/03	MCM	Nickel 63 in Soil
			7453-001	NP		04/10/03	04/26/03	MCM	Neptunium in Soil
			7453-001	PU		04/03/03	04/26/03	MCM	Plutonium, Isotopic in Solids
			7453-001	SR		04/03/03	04/26/03	MCM	Total Strontium in Soil
			7453-001	TC		04/14/03	04/26/03	MCM	Technetium 99 in Soil
			7453-001	TH		04/03/03	04/26/03	MCM	Thorium, Isotopic in Soil
			7453-001	U_T		04/07/03	04/15/03	MCM	Uranium, Total in Soil
R303053-02	Duplicate (R303053-01)		7453-002	93A/93		04/10/03	04/26/03	MCM	Gross Alpha in Soil
03/11/03	Borehole B8828 100-102ft	SOLID	7453-002	93B/93		04/10/03	04/26/03	MCM	Gross Beta in Soil
03/13/03		F03-003	7453-002	AM		04/07/03	04/26/03	MCM	Americium 241 in Soil
			7453-002	GAM		04/09/03	04/26/03	MCM	Gamma Scan
			7453-002	H		04/18/03	04/26/03	MCM	Tritium in Soil
			7453-002	NI_L		04/17/03	04/26/03	MCM	Nickel 63 in Soil
			7453-002	NP		04/10/03	04/26/03	MCM	Neptunium in Soil
			7453-002	PU		04/03/03	04/26/03	MCM	Plutonium, Isotopic in Solids
			7453-002	SR		04/03/03	04/26/03	MCM	Total Strontium in Soil
			7453-002	TC		04/14/03	04/26/03	MCM	Technetium 99 in Soil
			7453-002	TH		04/03/03	04/26/03	MCM	Thorium, Isotopic in Soil
R303053-03	Spike (R303053-01)		7453-003	NI_L		04/17/03	04/26/03	MCM	Nickel 63 in Soil
03/11/03	Borehole B8828 100-102ft	SOLID							
03/13/03		F03-003							
R303053-04	Duplicate (R303053-01)		7453-004	U_T		04/07/03	04/15/03	MCM	Uranium, Total in Soil
03/11/03	Borehole B8828 100-102ft	SOLID							
03/13/03		F03-003							

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 04/26/03

SDG 7453
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract No. 630
Case no SDG H2098

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
93A/93	F03-003	Gross Alpha in Soil	900.0_ALPHABETA_GPC	1			1	1	1		4
93B/93	F03-003	Gross Beta in Soil	900.0_ALPHABETA_GPC	1			1	1	1		4
AM	F03-003	Americium 241 in Soil	AMCMISO_IE_PLATE_AEA	1			1	1	1		4
GAM	F03-003	Gamma Scan	GAMMA_GS	1			1	1	1		4
H	F03-003	Tritium in Soil	906.0_H3_LSC	1			1	1	1		4
NI_L	F03-003	Nickel 63 in Soil	NI63_LSC	1			1	1	1	1	5
NP	F03-003	Neptunium in Soil	NP237_LLE_PLATE_AEA	1			1	1	1		4
PU	F03-003	Plutonium, Isotopic in Solids	PUISO_PLATE_AEA	1			1	1	1		4
SR	F03-003	Total Strontium in Soil	SRTOT_SEP_PRECIP_GPC	1			1	1	1		4
TC	F03-003	Technetium 99 in Soil	TC99_TR_SEP_LSC	1			1	1	1		4
TH	F03-003	Thorium, Isotopic in Soil	THISO_IE_PLATE_AEA	1			1	1	1		4
U_T	F03-003	Uranium, Total in Soil	UTOT_KPA	1			1	1	1		4
TOTALS				12			12	12	12	1	49

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 04/26/03

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2098

7451-006 **Method Blank**

METHOD BLANK

SDG 7453	Client/Case no Hanford	SDG H2098	
Contact Melissa C. Mannion	Contract No. 630		
Lab sample id R303039-06	Client sample id Method Blank		
Dept sample id 7451-006	Material/Matrix	SOLID	
	SAF No F03-003		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	0.066	1.6	3.0	10	U	93A
Gross Beta	12587-47-2	-0.571	3.8	6.4	15	U	93B
Tritium	10028-17-8	-0.102	0.16	0.28	400	U	H
Nickel 63	13981-37-8	-0.942	1.3	2.2	30	U	NI_L
Total Strontium	SR-RAD	-0.004	0.11	0.24	1.0	U	SR
Technetium 99	14133-76-7	0.050	0.17	0.53	15	U	TC
Thorium 228	14274-82-9	0	0.080	0.31		U	TH
Thorium 230	14269-63-7	0.080	0.16	0.31	1.0	U	TH
Thorium 232	TH-232	0	0.080	0.31	1.0	U	TH
Neptunium 237	13994-20-2	0.027	0.055	0.082	1.0	U	NP
Plutonium 238	13981-16-3	0	0.046	0.18	1.0	U	PU
Plutonium 239/240	PU-239/240	0.023	0.046	0.18	1.0	U	PU
Americium 241	14596-10-2	0.094	0.13	0.24	1.0	U	AM
Potassium 40	13966-00-2	U		1.3		U	GAM
Cobalt 60	10198-40-0	U		0.13	0.050	U	GAM
Cesium 137	10045-97-3	U		0.053	0.10	U	GAM
Radium 226	13982-63-3	U		0.11		U	GAM
Radium 228	15262-20-1	U		0.24		U	GAM
Europium 152	14683-23-9	U		0.13	0.10	U	GAM
Europium 154	15585-10-1	U		0.16	0.10	U	GAM
Europium 155	14391-16-3	U		0.15	0.10	U	GAM
Thorium 228	14274-82-9	U		0.078		U	GAM
Thorium 232	TH-232	U		0.24		U	GAM
Uranium 235	15117-96-1	U		0.22		U	GAM
Uranium 238	U-238	U		6.0		U	GAM
Americium 241	14596-10-2	U		0.28		U	GAM

200 Area Source Chara. 200-CS-1 OU

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/26/03

7451-006 **Method Blank**

B L A N K , c o n t .

SDG	7453	Client/Case no	Hanford SDG H2098
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R303039-06	Client sample id	Method Blank
Dept sample id	7451-006	Material/Matrix	SOLID
		SAF No	F03-003

QC-BLANK 44208

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/26/03

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2098

7451-010 **Method Blank**

METHOD BLANK

SDG 7453	Client/Case no Hanford	SDG H2098	
Contact Melissa C. Mannion	Contract No. 630		
Lab sample id R303039-10	Client sample id Method Blank		
Dept sample id 7451-010	Material/Matrix	SOLID	
	SAF No F03-003		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Uranium (ug/g)	7440-61-1	0	0.002	0.004	1.0	U	U_T

200 Area Source Chara. 200-CS-1 OU

QC-BLANK 44212

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 04/26/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2098

7451-005

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7453 | Client/Case no Hanford | SDG H2098

Contact Melissa C. Mannion | Contract No. 630

Lab sample id R303039-05 | Client sample id Lab Control Sample

Dept sample id 7451-005 | Material/Matrix SOLID

SAF No F03-003

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	204	15	4.0	10		93A	214	8.6	95	69-131	70-130
Gross Beta	234	11	6.5	15		93B	232	9.3	101	75-125	70-130
Tritium	13.9	0.44	0.29	400		H	14.0	0.56	99	83-117	80-120
Nickel 63	260	4.3	1.8	30		NI_L	274	11	95	84-116	80-120
Total Strontium	22.1	1.1	0.35	1.0		SR	22.2	0.89	100	82-118	80-120
Technetium 99	124	2.2	0.53	15		TC	120	4.8	103	83-117	80-120
Thorium 230	46.9	4.6	0.27	1.0		TH	44.8	1.8	105	82-118	80-120
Neptunium 237	16.3	1.5	0.087	1.0		NP	21.8	0.87	75	87-113	80-120
Plutonium 238	26.5	2.6	0.20	1.0		PU	26.8	1.1	99	83-117	80-120
Plutonium 239/240	29.2	2.8	0.20	1.0		PU	29.0	1.2	101	83-117	80-120
Americium 241	19.6	2.1	0.23	1.0		AM	21.0	0.84	93	82-118	80-120
Cobalt 60	5.23	0.30	0.13	0.050		GAM	5.66	0.23	92	77-123	80-120
Cesium 137	5.35	0.26	0.16	0.10		GAM	5.40	0.22	99	76-124	80-120

200 Area Source Chara. 200-CS-1 OU

QC-LCS 44207

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 04/26/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2098

7451-009

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7453 | Client/Case no Hanford | SDG H2098

Contact Melissa C. Mannion | Contract No. 630

Lab sample id R303039-09 | Client sample id Lab Control Sample

Dept sample id 7451-009 | Material/Matrix SOLID

SAF No F03-003

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Total Uranium (ug/g)	19.3	2.3	0.039	1.0		U_T	18.1	0.72	107	75-125	80-120

200 Area Source Chara. 200-CS-1 OU

QC-LCS 44211

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 04/26/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2098

7453-002

B16541

DUPLICATE

SDG 7453
Contact Melissa C. Mannion

DUPLICATE
Lab sample id R303053-02
Dept sample id 7453-002
% solids 95.2

ORIGINAL
Lab sample id R303053-01
Dept sample id 7453-001
Received 03/13/03
% solids 95.2

Client/Case no Hanford SDG H2098
Contract No. 630
Client sample id B16541
Location/Matrix Borehole B8828 100-102ft SOLID
Collected/Weight 03/11/03 10:45 662.3 g
Custody/SAF No F03-003-155 F03-003

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALIFIERS	RPD %	3σ PROT TOT LIMIT
Gross Alpha	7.36	3.6	4.0	10		93A	11.0	4.2	4.4		40	100
Gross Beta	19.3	5.6	8.0	15		93B	16.4	4.7	6.5		16	69
Tritium	-0.035	0.10	0.17	400	U	H	0.063	0.11	0.19	U	-	
Nickel 63	0.746	1.1	1.9	30	U	NI_L	1.01	1.2	2.0	U	-	
Total Strontium	-0.053	0.10	0.23	1.0	U	SR	-0.005	0.11	0.23	U	-	
Technetium 99	0.208	0.20	0.56	15	U	TC	0.162	0.21	0.62	U	-	
Thorium 228	1.11	0.42	0.26			TH	0.966	0.37	0.27		14	82
Thorium 230	1.18	0.43	0.26	1.0		TH	1.25	0.44	0.27		6	77
Thorium 232	0.934	0.35	0.26	1.0		TH	0.643	0.29	0.27		37	87
Neptunium 237	0	0.054	0.081	1.0	U	NP	0	0.056	0.084	U	-	
Plutonium 238	-0.020	0.040	0.15	1.0	U	PU	0.025	0.050	0.19	U	-	
Plutonium 239/240	0	0.040	0.15	1.0	U	PU	0	0.050	0.19	U	-	
Americium 241	0.103	0.14	0.26	1.0	U	AM	-0.028	0.057	0.22	U	-	
Potassium 40	10.5	1.2	0.47			GAM	12.1	2.2	1.6		14	46
Cobalt 60	U		0.088	0.050	U	GAM	U		0.13	U	-	
Cesium 137	U		0.074	0.10	U	GAM	U		0.095	U	-	
Radium 226	0.424	0.14	0.15			GAM	0.517	0.15	0.14		20	73
Radium 228	0.536	0.28	0.30			GAM	0.482	0.44	0.54	U	11	157
Europium 152	U		0.16	0.10	U	GAM	U		0.25	U	-	
Europium 154	U		0.26	0.10	U	GAM	U		0.36	U	-	
Europium 155	U		0.19	0.10	U	GAM	U		0.24	U	-	
Thorium 228	0.584	0.086	0.092			GAM	0.553	0.11	0.12		5	49
Thorium 232	0.536	0.28	0.30			GAM	0.482	0.44	0.54	U	11	157
Uranium 235	U		0.28		U	GAM	U		0.38	U	-	
Uranium 238	U		8.8		U	GAM	U		15	U	-	
Americium 241	U		0.38		U	GAM	U		0.26	U	-	

200 Area Source Chara. 200-CS-1 OU

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 04/26/03

7453-002

B16541

DUPLICATE, cont.

SDG	7453			Client/Case no	Hanford SDG H2098
Contact	Melissa C. Mannion			Contract	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R303053-02	Lab sample id	R303053-01	Client sample id	B16541
Dept sample id	7453-002	Dept sample id	7453-001	Location/Matrix	Borehole B8828 100-102ft SOLID
		Received	03/13/03	Collected/Weight	03/11/03 10:45 662.3 g
% solids	95.2	% solids	95.2	Custody/SAF No	F03-003-155 F03-003

QC-DUP#1 44254

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	04/26/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2098

7453-004 B16541

DUPLICATE

SDG 7453			Client/Case no Hanford SDG H2098
Contact Melissa C. Mannion			Contract No. 630
DUPLICATE		ORIGINAL	
Lab sample id R303053-04	Lab sample id R303053-01		Client sample id B16541
Dept sample id 7453-004	Dept sample id 7453-001		Location/Matrix Borehole B8828 100-102ft SOLID
	Received 03/13/03		Collected/Weight 03/11/03 10:45 662.3 g
% solids 95.2	% solids 95.2		Custody/SAF No F03-003-155 F03-003

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Total Uranium (ug/g)	0.599	0.068	0.004	1.0		U_T	0.615	0.070	0.004		3	31

200 Area Source Chara. 200-CS-1 OU

QC-DUP#1 44198

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 04/26/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2098

7453-003 B16541

MATRIX SPIKE

SDG 7453 Client/Case no Hanford SDG H2098

Contact Melissa C. Mannion Contract No. 630

MATRIX SPIKE	ORIGINAL	
Lab sample id R303053-03	Lab sample id R303053-01	Client sample id B16541
Dept sample id 7453-003	Dept sample id 7453-001	Location/Matrix Borehole B8828 100-102ft SOLID
	Received 03/13/03	Collected/Weight 03/11/03 10:45 662.3 g
% solids 95.2	% solids 95.2	Custody/SAF No F03-003-155 F03-003

ANALYTE	SPIKE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	ORIGINAL pCi/g	2σ ERR (COUNT)	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Nickel 63	896	9.1	2.2	30		NI_L	960	38	1.01	1.2	93	85-115	60-140

200 Area Source Chara. 200-CS-1 OU

QC-MS#1 44255

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-MS
Version 3.06
Report date 04/26/03

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2098

7453-001 B16541

DATA SHEET

SDG	7453	Client/Case no	Hanford SDG H2098
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R303053-01	Client sample id	B16541
Dept sample id	7453-001	Location/Matrix	Borehole B8828 100-102ft SOLID
Received	03/13/03	Collected/Weight	03/11/03 10:45 662.3 g
% solids	95.2	Custody/SAF No	F03-003-155 F03-003

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	11.0	4.2	4.4	10		93A
Gross Beta	12587-47-2	16.4	4.7	6.5	15		93B
Tritium	10028-17-8	0.063	0.11	0.19	400	U	H
Nickel 63	13981-37-8	1.01	1.2	2.0	30	U	NI_L
Total Strontium	SR-RAD	-0.005	0.11	0.23	1.0	U	SR
Technetium 99	14133-76-7	0.162	0.21	0.62	15	U	TC
Thorium 228	14274-82-9	0.966	0.37	0.27			TH
Thorium 230	14269-63-7	1.25	0.44	0.27	1.0		TH
Thorium 232	TH-232	0.643	0.29	0.27	1.0		TH
Total Uranium (ug/g)	7440-61-1	0.615	0.070	0.004	1.0		U_T
Neptunium 237	13994-20-2	0	0.056	0.084	1.0	U	NP
Plutonium 238	13981-16-3	0.025	0.050	0.19	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.050	0.19	1.0	U	PU
Americium 241	14596-10-2	-0.028	0.057	0.22	1.0	U	AM
Potassium 40	13966-00-2	12.1	2.2	1.6			GAM
Cobalt 60	10198-40-0	U		0.13	0.050	U	GAM
Cesium 137	10045-97-3	U		0.095	0.10	U	GAM
Radium 226	13982-63-3	0.517	0.15	0.14			GAM
Radium 228	15262-20-1	0.482	0.44	0.54		U	GAM
Europium 152	14683-23-9	U		0.25	0.10	U	GAM
Europium 154	15585-10-1	U		0.36	0.10	U	GAM
Europium 155	14391-16-3	U		0.24	0.10	U	GAM
Thorium 228	14274-82-9	0.553	0.11	0.12			GAM
Thorium 232	TH-232	0.482	0.44	0.54		U	GAM
Uranium 235	15117-96-1	U		0.38		U	GAM
Uranium 238	U-238	U		15		U	GAM
Americium 241	14596-10-2	U		0.26		U	GAM

200 Area Source Chara. 200-CS-1 OU

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/26/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2098

Test AM Matrix SOLID
SDG 7453
Contact Melissa C. Mannion

LAB METHOD SUMMARY

AMERICIUM 241 IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2098

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Americium 241	
Preparation batch 7043-127						
R303039-05			7451-005	LCS (QC ID=44207)	ok	
R303039-06			7451-006	BLK (QC ID=44208)	U	
R303053-01			7453-001	B16541	U	
R303053-02			7453-002	Duplicate (R303053-01)	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.0	
200 Area Source Chara. 200-CS-1 OU						

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7043-127			2σ prep error 5.0 %				Reference Lab Notebook 7043 pg. 127									
R303039-05			LCS (QC ID=44207)	0.23	0.500			70		126				04/07/03	04/07	SS-043
R303039-06			BLK (QC ID=44208)	0.24	0.500			65		126				04/07/03	04/07	SS-044
R303053-01			B16541	0.22	0.500			75		126			27	04/07/03	04/07	SS-047
R303053-02			Duplicate (R303053-01) (QC ID=44254)	0.26	0.500			62		126			27	04/07/03	04/07	SS-048
Nominal values and limits from method				1.0	0.500			20-105		100	100		180			

PROCEDURES	REFERENCE	
	AMCMISO_IE_PLATE_AEA	
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-963	Americium and Curium in Water and Dissolved Samples by Extraction Chromatography, rev 3
	CP-008	Heavy Element Electroplating, rev 7

AVERAGES ± 2 SD FOR 4 SAMPLES			
	MDA	0.24	± 0.034
	YIELD	68	± 11

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 04/26/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2098

Test NP Matrix SOLID
SDG 7453
Contact Melissa C. Mannion

LAB METHOD SUMMARY

NEPTUNIUM IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2098

RESULTS

LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	CLIENT SAMPLE ID	Neptunium 237
Preparation batch 7043-127					
R303039-05			7451-005	LCS (QC ID=44207)	LOW
R303039-06			7451-006	BLK (QC ID=44208)	U
R303053-01			7453-001	B16541	U
R303053-02			7453-002	Duplicate (R303053-01)	- U
Nominal values and limits from method				RDLs (pCi/g)	1.0
200 Area Source Chara. 200-CS-1 OU					

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF- FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 7043-127			2σ prep error 5.0 %		Reference Lab Notebook 7043 pg. 127											
R303039-05			LCS (QC ID=44207)	0.087	0.500			71	138					04/10/03	04/10	SS-013
R303039-06			BLK (QC ID=44208)	0.082	0.500			68	138					04/10/03	04/10	SS-014
R303053-01			B16541	0.084	0.500			69	138				30	04/10/03	04/10	SS-016
R303053-02			Duplicate (R303053-01) (QC ID=44254)	0.081	0.500			73	139				30	04/10/03	04/10	SS-031
Nominal values and limits from method				1.0	0.500			20-105	100				180			

PROCEDURES	REFERENCE	
	NP237_LLE_PLATE_AEA	
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-934	Neptunium from Solids and Water by Extraction Chromatography, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES			
	MDA	0.084	± 0.005
	YIELD	70	± 4

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 04/26/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2098

Test PU Matrix SOLID
SDG 7453
Contact Melissa C. Mannion

LAB METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2098

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Plutonium 238		Plutonium 239/240	
Preparation batch 7043-127								
R303039-05			7451-005	LCS (QC ID=44207)	ok		ok	
R303039-06			7451-006	BLK (QC ID=44208)	U		U	
R303053-01			7453-001	B16541	U		U	
R303053-02			7453-002	Duplicate (R303053-01)	-	U	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.0		1.0	
200 Area Source Chara. 200-CS-1 OU								

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7043-127			2σ prep error 5.0 %	Reference Lab Notebook 7043 pg. 127												
R303039-05			LCS (QC ID=44207)	0.20	0.500			66		159				04/03/03	04/03	SS-042
R303039-06			BLK (QC ID=44208)	0.18	0.500			73		158				04/03/03	04/03	SS-043
R303053-01			B16541	0.19	0.500			58		158			23	04/03/03	04/03	SS-045
R303053-02			Duplicate (R303053-01) (QC ID=44254)	0.15	0.500			84		159			23	04/03/03	04/03	SS-047
Nominal values and limits from method				1.0	0.500			20-105		100	100		180			

PROCEDURES	REFERENCE	PUISO_PLATE_AEA
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-941	Plutonium in Water and Dissolved Samples by Extraction Chromatography, rev 1
	CP-008	Heavy Element Electroplating, rev 7

AVERAGES ± 2 SD FOR 4 SAMPLES			
	MDA	0.18	± 0.043
	YIELD	70	± 22

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 04/26/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2098

Test TH Matrix SOLID
SDG 7453
Contact Melissa C. Mannion

LAB METHOD SUMMARY

THORIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2098

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Thorium 230
Preparation batch 7043-127					
R303039-05			7451-005	LCS (QC ID=44207)	ok
R303039-06			7451-006	BLK (QC ID=44208)	U
R303053-01			7453-001	B16541	1.25
R303053-02			7453-002	Duplicate (R303053-01)	ok
Nominal values and limits from method				RDLs (pCi/g)	1.0
200 Area Source Chara. 200-CS-1 OU					

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7043-127			2σ prep error 5.0 %		Reference Lab Notebook 7043 pg. 127											
R303039-05			LCS (QC ID=44207)	0.27	0.250			87		174				04/03/03	04/03	SS-042
R303039-06			BLK (QC ID=44208)	0.31	0.250			75		177				04/03/03	04/03	SS-043
R303053-01			B16541	0.27	0.250			73		176			23	04/03/03	04/03	SS-045
R303053-02			Duplicate (R303053-01) (QC ID=44254)	0.26	0.250			87		177			23	04/03/03	04/03	SS-047
Nominal values and limits from method				1.0	0.250			20-105		150			180			

PROCEDURES	REFERENCE	THISO_IE_PLATE_AEA
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-907	Thorium in Water and Dissolved Solid Samples by TEVA and Anion Exchange Column Method, rev 2
	CP-008	Heavy Element Electroplating, rev 7

AVERAGES ± 2 SD FOR 4 SAMPLES				
	MDA	0.28	±	0.044
	YIELD	80	±	15

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 04/26/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2098

Test SR Matrix SOLID
SDG 7453
Contact Melissa C. Mannion

LAB METHOD SUMMARY

TOTAL STRONTIUM IN SOIL
BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H2098

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Total Strontium	
Preparation batch 7043-127						
R303039-05			7451-005	LCS (QC ID=44207)	ok	
R303039-06			7451-006	BLK (QC ID=44208)	U	
R303053-01			7453-001	B16541	U	
R303053-02			7453-002	Duplicate (R303053-01)	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.0	
200 Area Source Chara. 200-CS-1 OU						

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7043-127			2σ prep error 10.0 %	Reference Lab Notebook 7043 pg. 127												
R303039-05			LCS (QC ID=44207)	0.35	1.00			78		60				04/03/03	04/03	GRB-208
R303039-06			BLK (QC ID=44208)	0.24	1.00			77		100				04/03/03	04/03	GRB-220
R303053-01			B16541	0.23	1.00			92		100			23	04/03/03	04/03	GRB-231
R303053-02			Duplicate (R303053-01) (QC ID=44254)	0.23	1.00			87		100			23	04/03/03	04/03	GRB-232
Nominal values and limits from method				1.0	1.00			30-105		100			180			

PROCEDURES	REFERENCE	SRTOT_SEP_PRECIP_GPC
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-381	Strontium in Solids, rev 1

AVERAGES ± 2 SD FOR 4 SAMPLES			
	MDA	0.26	± 0.12
	YIELD	84	± 14

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 04/26/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2098

Test TC Matrix SOLID
SDG 7453
Contact Melissa C. Mannion

LAB METHOD SUMMARY

TECHNETIUM 99 IN SOIL
BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H2098

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Technetium 99	
Preparation batch 7043-127						
R303039-05			7451-005	LCS (QC ID=44207)	ok	
R303039-06			7451-006	BLK (QC ID=44208)	U	
R303053-01			7453-001	B16541	U	
R303053-02			7453-002	Duplicate (R303053-01)	-	U
Nominal values and limits from method				RDLs (pCi/g)	15	
200 Area Source Chara. 200-CS-1 OU						

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7043-127 2σ prep error 10.0 % Reference Lab Notebook 7043 pg. 127																
R303039-05			LCS (QC ID=44207)	0.53	1.00			94		50				04/10/03	04/15	GRB-222
R303039-06			BLK (QC ID=44208)	0.53	1.00			97		50				04/10/03	04/14	GRB-219
R303053-01			B16541	0.62	1.02			84		50			34	04/10/03	04/14	GRB-221
R303053-02			Duplicate (R303053-01) (QC ID=44254)	0.56	1.02			87		50			34	04/10/03	04/14	GRB-222
Nominal values and limits from method				15	1.00			20-105		50			180			

PROCEDURES	REFERENCE	TC99_TR_SEP_LSC
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-021	Preparation of Tc-99m Tracer, rev 2
	CP-002	Q.C. Preparation, rev 4
	CP-003	Addition of Carriers and Tracers, rev 5
	CP-542	Technetium-99 Purification (Soil) by Extraction Chromatography, rev 2
	CP-008	Heavy Element Electroplating, rev 7

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.56 ± 0.085
YIELD 90 ± 12

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 04/26/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2098

Test 93A Matrix SOLID
SDG 7453
Contact Melissa C. Mannion

LAB METHOD SUMMARY

GROSS ALPHA IN SOIL
GAS PROPORTIONAL COUNTING

Client Hanford
Contract No. 630
Contract SDG H2098

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Gross Alpha
Preparation batch 7043-127					
R303039-05	93		7451-005	LCS (QC ID=44207)	ok
R303039-06	93		7451-006	BLK (QC ID=44208)	U
R303053-01	93		7453-001	B16541	11.0
R303053-02	93		7453-002	Duplicate (R303053-01)	ok
Nominal values and limits from method				RDLs (pCi/g)	10
200 Area Source Chara. 200-CS-1 OU					

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7043-127			2σ prep error 20.0 %	Reference Lab Notebook 7043 pg. 127												
R303039-05	93		LCS (QC ID=44207)	4.0	0.100			25		100				04/08/03	04/10	GRB-115
R303039-06	93		BLK (QC ID=44208)	3.0	0.100			24		100				04/08/03	04/09	GRB-105
R303053-01	93		B16541	4.4	0.100			36		100			30	04/08/03	04/10	GRB-115
R303053-02	93		Duplicate (R303053-01) (QC ID=44254)	4.0	0.100			36		100			30	04/08/03	04/10	GRB-114
Nominal values and limits from method				10	0.100			5-250		100			180			

PROCEDURES	REFERENCE	
	900.0_ALPHABETA_GPC	
	CP-060	Soil Preparation, rev 4
	CP-070	Soil Dissolution, < 1.0g Aliquot, rev 5
	CP-125	Gross Alpha and Beta in Dissolved Solids, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES			
	MDA	3.8	± 1.2
	RESIDUE	30	± 13

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 04/26/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2098

Test 93B Matrix SOLID
SDG 7453
Contact Melissa C. Mannion

LAB METHOD SUMMARY

GROSS BETA IN SOIL
GAS PROPORTIONAL COUNTING

Client Hanford
Contract No. 630
Contract SDG H2098

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Gross Beta
Preparation batch 7043-127					
R303039-05	93		7451-005	LCS (QC ID=44207)	ok
R303039-06	93		7451-006	BLK (QC ID=44208)	U
R303053-01	93		7453-001	B16541	16.4
R303053-02	93		7453-002	Duplicate (R303053-01)	ok
Nominal values and limits from method				RDLs (pCi/g)	15
200 Area Source Chara. 200-CS-1 OU					

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7043-127			2σ prep error 15.0 %		Reference Lab Notebook 7043 pg. 127											
R303039-05	93		LCS (QC ID=44207)	6.5	0.100			25	100					04/08/03	04/10	GRB-115
R303039-06	93		BLK (QC ID=44208)	6.4	0.100			24	100					04/08/03	04/09	GRB-105
R303053-01	93		B16541	6.5	0.100			36	100				30	04/08/03	04/10	GRB-115
R303053-02	93		Duplicate (R303053-01) (QC ID=44254)	8.0	0.100			36	100				30	04/08/03	04/10	GRB-114
Nominal values and limits from method				15	0.100			5-250	100				180			

PROCEDURES	REFERENCE	
	900.0_ALPHABETA_GPC	
	CP-060	Soil Preparation, rev 4
	CP-070	Soil Dissolution, < 1.0g Aliquot, rev 5
	CP-125	Gross Alpha and Beta in Dissolved Solids, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES			
	MDA	6.8	± 1.5
	RESIDUE	30	± 13

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 04/26/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2098

Test GAM Matrix SOLID
SDG 7453
Contact Melissa C. Mannion

LAB METHOD SUMMARY

GAMMA SCAN
GAMMA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2098

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Cobalt 60		Cesium 137	
Preparation batch 7043-127								
R303039-05			7451-005	LCS (QC ID=44207)	ok		ok	
R303039-06			7451-006	BLK (QC ID=44208)	U		U	
R303053-01			7453-001	B16541	U		U	
R303053-02			7453-002	Duplicate (R303053-01)	-	U	-	U
Nominal values and limits from method				RDLs (pCi/g)	0.050		0.10	
200 Area Source Chara. 200-CS-1 OU								

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7043-127			2σ prep error 15.0 % Reference Lab Notebook 7043 pg. 127													
R303039-05			LCS (QC ID=44207)	0.13	189					118				03/28/03	04/03	MB,05,00
R303039-06			BLK (QC ID=44208)	0.40	189					118				03/28/03	04/03	MB,08,00
R303053-01			B16541	0.73	188					107			31	03/28/03	04/11	JR,03,00
R303053-02			Duplicate (R303053-01) (QC ID=44254)	0.63	188					149			29	03/28/03	04/09	JR,05,00
Nominal values and limits from method				0.050	189					100			180			

PROCEDURES	REFERENCE	GAMMA_GS
	CP-060	Soil Preparation, rev 4
	CP-100	Ge(Li) Preparation for Commercial Samples, rev 5

AVERAGES ± 2 SD FOR 4 SAMPLES				
	MDA	0.47	±	0.53
	YIELD		±	

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 04/26/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2098

Test U T Matrix SOLID
SDG 7453
Contact Melissa C. Mannion

LAB METHOD SUMMARY

URANIUM, TOTAL IN SOIL
KINETIC PHOSPHORIMETRY

Client Hanford
Contract No. 630
Contract SDG H2098

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Total Uranium
Preparation batch 7043-127					
R303039-09			7451-009	LCS (QC ID=44211)	ok
R303039-10			7451-010	BLK (QC ID=44212)	U
R303053-01			7453-001	B16541	0.615
R303053-04			7453-004	Duplicate (R303053-01)	ok
Nominal values and limits from method				RDLs (ug/g)	1.0
200 Area Source Chara. 200-CS-1 OU					

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA ug/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7043-127			2σ prep error 9.0 %	Reference Lab Notebook 7043 pg. 127												
R303039-09			LCS (QC ID=44211)	0.039	0.100									04/07/03	04/07	KPA-001
R303039-10			BLK (QC ID=44212)	0.004	0.100									04/07/03	04/07	KPA-001
R303053-01			B16541	0.004	0.100								27	04/07/03	04/07	KPA-001
R303053-04			Duplicate (R303053-01) (QC ID=44198)	0.004	0.100								27	04/07/03	04/07	KPA-001
Nominal values and limits from method				1.0	0.100								180			

PROCEDURES	REFERENCE	UTOT_KPA
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-044	Sample Preparation for Total Uranium by Kinetic Phosphorimetry, rev 4
	CP-928	Total Uranium by Kinetic Phosphorimetry, rev 5

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.013 ± 0.035
YIELD _____ ± _____

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 04/26/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2098

Test H Matrix SOLID
SDG 7453
Contact Melissa C. Mannion

LAB METHOD SUMMARY

TRITIUM IN SOIL
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H2098

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Tritium	
Preparation batch 7043-127						
R303039-05			7451-005	LCS (QC ID=44207)	ok	
R303039-06			7451-006	BLK (QC ID=44208)	U	
R303053-01			7453-001	B16541	U	
R303053-02			7453-002	Duplicate (R303053-01)	-	U
Nominal values and limits from method				RDLs (pCi/g)	400	
200 Area Source Chara. 200-CS-1 OU						

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7043-127			2σ prep error 10.0 % Reference Lab Notebook 7043 pg. 127													
R303039-05			LCS (QC ID=44207)	0.29	20.0			33		120				04/16/03	04/17	LSC-005
R303039-06			BLK (QC ID=44208)	0.28	20.0			33		120				04/16/03	04/17	LSC-005
R303053-01			B16541	0.19	20.8			51		120			38	04/16/03	04/18	LSC-005
R303053-02			Duplicate (R303053-01) (QC ID=44254)	0.17	21.0			51		120			38	04/16/03	04/18	LSC-005
Nominal values and limits from method				400	20.0					25			180			

PROCEDURES REFERENCE 906.0_H3_LSC
CP-218 Tritium in Soil Samples by Azeotropic Distillation, rev 1

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.23 ± 0.12
YIELD 42 ± 21

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 04/26/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2098

Test NI_L Matrix SOLID
SDG 7453
Contact Melissa C. Mannion

LAB METHOD SUMMARY

NICKEL 63 IN SOIL
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H2098

RESULTS

LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	CLIENT SAMPLE ID	Nickel 63	
Preparation batch 7043-127						
R303039-05			7451-005	LCS (QC ID=44207)	ok	
R303039-06			7451-006	BLK (QC ID=44208)	U	
R303053-01			7453-001	B16541	U	
R303053-02			7453-002	Duplicate (R303053-01)	-	U
R303053-03			7453-003	Spike (R303053-01)	ok	
Nominal values and limits from method				RDLs (pCi/g)	30	
200 Area Source Chara. 200-CS-1 OU						

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF- FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 7043-127			2σ prep error 10.0 %		Reference Lab Notebook 7043 pg. 127											
R303039-05			LCS (QC ID=44207)	1.8	0.500			100		100				04/16/03	04/17	LSC-007
R303039-06			BLK (QC ID=44208)	2.2	0.500			100		100				04/16/03	04/17	LSC-007
R303053-01			B16541	2.0	0.500			100		100			37	04/16/03	04/17	LSC-007
R303053-02			Duplicate (R303053-01) (QC ID=55254)	1.9	0.500			100		100			37	04/16/03	04/17	LSC-007
R303053-03			Spike (R303053-01) (QC ID=55255)	2.2	0.500			100		74			37	04/16/03	04/17	LSC-007
Nominal values and limits from method				30	0.500			30-105		50			180			

PROCEDURES	REFERENCE	
	NI63_LSC	
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-281	Nickel-63 Purification By Extraction Chromatography, rev 0

AVERAGES ± 2 SD FOR 5 SAMPLES			
	MDA	2.0	± 0.36
	YIELD	100	± 0

Lab id EBRLNE
Protocol Hanford
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2098

SDG 7453
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H2098

SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

* LAB SAMPLE ID is the lab's primary identification for a sample.

* DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.

* CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.

* QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

  QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

* All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 04/26/03

SDG 7453
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H2098

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

* The preparation batches are shown in the same order as the Method Summary Reports are printed.

* Only analyses of planchets relevant to the SDG are included.

* Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.

* The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

  These qualifiers should be reviewed as follows:

  X Some data has been manually entered or modified. Transcription errors are possible.

  P One or more results are 'preliminary'. The data is not ready for final reporting.

  2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

  Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

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REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H2098

WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

* TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.

* SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.

* The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.

* PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.

* For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

* The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

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Contact Melissa C. Mannion

REPORT GUIDE

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DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

* TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.

* The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

  The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

* ERRORs can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.

* A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.

* When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity).

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DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.

B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.

H Similar to 'L' except the recovery was high.

P The RESULT is 'preliminary'.

X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.

2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

* An MDA is underlined if it is bigger than its RDL.

SDG 7453
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GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG H2098

DATA SHEET

* An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.

* A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.

* When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 04/26/03

SDG 7453
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H2098

LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.

* An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

  An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The error of RESULT, including that introduced by rounding the result prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits for the recovery.

* The recovery is underlined if it is outside either of these ranges.

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Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 04/26/03

SDG 7453
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
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DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTs divided by their average expressed as a percent.

  If both RESULTs are less than their MDAs, no RPD is computed and a '-' is printed.

  For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

* The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTs prior to printing.

  If this limit is labeled TOT, it includes the preparation error in the RESULTs. If labeled CNT, it does not.

  This value reported for this limit is at most 999.

* The second limit for the RPD is the larger of:

  1. A fixed percentage specified in the protocol.

Lab id EBRLNE
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DUPLICATE

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

* The RPD is underlined if it is greater than either limit.

* If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

  Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

* The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

SDG 7453
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H2098

MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

  An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The errors of the two RESULTs, including those introduced by rounding them prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
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SDG 7453
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG H2098

MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

* The recovery is underlined (out of spec) if it is outside either of these ranges.

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SDG 7453
Contact Melissa C. Mannion

REPORT GUIDE

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Contract No. 630
Case no SDG_H2098

METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

* Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

  There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

* The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

  The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

* If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

  The J and X flags are as on the data sheet.

* Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.

* Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

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Version 3.06
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METHOD SUMMARY

means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.

* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

  MDAs are underlined if greater than the printed RDL.

* Aliquots are underlined if less than the nominal value specified for the method.

* Prepareation factors are underlined if greater than the nominal value specified for the method.

* Dilution factors are underlined if greater than the nominal value specified for the method.

* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.

* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.

* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

SDG 7453
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
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Case no SDG H2098

METHOD SUMMARY

* Count times are underlined if less than the nominal value specified for the method.

* Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.

* Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.

* Days Held are underlined if greater than the holding time specified in the protocol.

* Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1÷3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

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SDG 7453
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG_H2098

METHOD SUMMARY

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 04/26/03

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-003-155	Page 1 of 1

Collector Fahlberg/Johansen/Thomas	**Company Contact** CS Cearlock **Telephone No.** 373-3922	**Project Coordinator** TRENT, SJ	**Price Code** 8N **Data Turnaround** 45 Days
Project Designation 200 Area Source Characterization 200-CS-1 OU - Soil Sampl	**Sampling Location** Borehole B8828 (100-102 ft) H2098 (7453)	**SAF No.** F03-003	**Air Quality** ☐
Ice Chest No. ERC 02-003	**Field Logbook No.** HNF-N-3251 **COA** ~~117514ES10~~ 118300ES10 TM33-03-03	**Method of Shipment** Federal Express	
Shipped To EBERLINE SERVICES (Formerly TMA)	**Offsite Property No.** A030 159	**Bill of Lading/Air Bill No.** 7922-0684 1440	

POSSIBLE SAMPLE HAZARDS/REMARKS
Radioactive
Tie To B15XM1

Special Handling and/or Storage
None

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None	None	
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG	aG	
No. of Container(s)	1	1	1	1	1	1	1	1 TM33-7-03	1	
Volume	250mL	250mL	250mL	250mL	500mL	500mL	125mL	~~1000mL~~ 500 mL	125mL	
SAMPLE ANALYSIS	VOA - 8260A (TCL)	See item (1) in Special Instructions.	Alcohols, Glycols, & Ketones - 8015M (Add-on) (1-Propanol, Ethanol)	PCBs - 8082	See item (2) in Special Instructions.	See item (3) in Special Instructions.	pH (Soil) - 9045	See item (4) in Special Instructions.	Nickel-63; Technetium-99; Tritium - H3	

Sample No.	Matrix *	Sample Date	Sample Time								
B16541	SOIL	3-11-03	1045							X	X

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From FH	Date/Time 3/11/03 1230	Received By/Stored In ERC	Date/Time 3/11/03 1230
Relinquished By/Removed From R. Fahlberg	Date/Time 1230 3.11.03	Received By/Stored In LB 3728	Date/Time 1230 3.11.03
Relinquished By/Removed From LB 3728	Date/Time 3.12.03 1000	Received By/Stored In R. Fahlberg	Date/Time 1000 3.12.03
Relinquished By/Removed From ERC R. Fahlberg	Date/Time 1000 3.12.03	Received By/Stored In Fed Ex	Date/Time
Relinquished By/Removed From FED EX	~~Date/Time~~	Received By/Stored In	Date/Time 3-13-03 1000
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS
Lab reports Decane as a TIC if detectable, and report diesel and kerosene range compounds from WTPH-D analysis. FH acknowledges that the holding time for Nitrate by EPA 300.0 or 9056 will not be met. Analyze pH within 24 hr of receipt.

(1) ~~Semi-VOA – 8270A (Add-On) (Tributyl phosphate); TPH-Diesel Range - WTPH-D~~
(2) ~~ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver);~~ ICP Metals - 6010A (Supertrace Add-On) (Beryllium, Copper, Nickel, Vanadium, Zinc); Mercury - 7471 - (CV); ~~Chromium Hex~~ - 7196
(3) ~~IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); NO2/NO3 - 353.2; Ammonia - 350.3; Total Cyanide - 9010; Sulfides - 9030~~
(4) Gross Alpha; Gross Beta; Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Radium-228); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Isotopic Uranium; Americium-241; Neptunium-237; Strontium-89,90 – Total Sr; Total Uranium

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
A=Air
SS=Drum Solids
O=Other Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

EBERLINE SERVICES

ANALYTICAL SERVICES GROUP
Richmond, CA Laboratory

SAMPLE RECEIPT CHECKLIST

Client: FLR Date/Time received 1000 3-13-03

CoC No. F03-003-155

Container I.D. No. ERC-02-003 Requested TAT (Days) 45 P.O. Received Yes [ ] No [ ]

INSPECTION

1.	Custody seals on shipping container intact?	Yes [✓]	No [ ]	N/A [ ]
2.	Custody seals on shipping container dated & signed?	Yes [✓]	No [ ]	N/A [ ]
3.	Custody seals on sample containers intact?	Yes [✓]	No [ ]	N/A [ ]
4.	Custody seals on sample containers dated & signed?	Yes [✓]	No [ ]	N/A [ ]
5.	Packing material is:	Wet [ ]	Dry [✓]	
6.	Number of samples in shipping container: 1			
7.	Number of containers per sample: 2 (Or see CoC _____)			
8.	Paperwork agrees with samples?	Yes [✓]	No [ ]	
9.	Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [✓]			
10.	Samples are: In good condition [✓] Leaking [ ] Broken Container [ ] Missing [ ]			
11.	*Samples are: Preserved [ ] Not preserved [✓] Preservative* _____			
12.	Describe any anomalies: _____			
13.	Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____			
14.	Received by _____ Date: 3-13-03 Time: 1000			

Customer Sample No.	cpm	mR/hr	wipe	Customer Sample No.	cpm	mR/hr	wipe
B16541	50	0.019					

Ion Chamber Ser. No. _____ Calibration date _____

Alpha Meter Ser. No. _____ Calibration date _____

Beta/Gamma Meter Ser. No. _____ Calibration date _____

LIONVILLE LABORATORY INC.

11 April 2003

Mr. Steve Trent
Fluor Hanford Inc.
825 Jadwin Ave.
Richland, WA 99352

Subject: Contract No. 630
Analytical Data Package

Dear Mr. Trent:

Enclosed are the hard copy analytical reports for the batch number/fraction indicated (marked X) in the following table:

LvLI Batch #	0303L932
SDG #	H2098
SAF #	F03-003
Date Received	3-13-03
# Samples	1
Matrix	Soil
Volatiles	X
Semivolatiles	X
Pest/PCB	X
DRO/GRO/KRO	X
GC Alcohol	X
Metals	X
Inorganics	X

The electronic data deliverable (EDD) will be emailed shortly. If you have any questions, please don't hesitate to contact me at (610) 280-3012.

Sincerely,
Lionville Laboratory Incorporated

Orlette S. Johnson
Project Manager

r:\group\pm\orlette\tnu-hanford\data\fc_ltrs.doc

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

Lionville Laboratory, Inc.
VOA ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD F03-003, H2098

RFW LOT # :0303L932

CLIENT ID	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
B16541	001	S	03LVH048	03/11/03	03/13/03	N/A	03/14/03
B16541	001 MS	S	03LVH048	03/11/03	03/13/03	N/A	03/14/03
B16541	001 MSD	S	03LVH048	03/11/03	03/13/03	N/A	03/14/03
LAB QC:							
VBLKLM	MB1	S	03LVH048	N/A	N/A	N/A	03/14/03
VBLKLM	MB1 BS	S	03LVH048	N/A	N/A	N/A	03/14/03

LIONVILLE LABORATORY INC.

Client: TNU-HANFORD F03-003
LVL #: 0303L932
SDG/SAF # H2098/F03-003

W.O. #: 11343-606-001-9999-00
Date Received: 03-13-2003

GC/MS VOLATILE

One (1) soil sample was collected on 03-11-2003.

The sample and its associated QC samples were analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8260B for TCL volatile target compounds on 03-14-2003.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from a sample that met LvLI's sample acceptance policy.

2. The sample was analyzed within holding time.

3. Non-target compounds were not detected in the sample.

4. All surrogate recoveries were within EPA QC limits.

5. All matrix spike recoveries were within EPA QC limits.

6. All blank spike recoveries were within EPA QC limits.

7. Internal standard area and retention time criteria were met.

8. "I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

by _____ 03-24-03

J. Michael Taylor
President
Lionville Laboratory Incorporated

Date

som\group\data\voa\tnu-hanford\0303-932.doc

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

GLOSSARY

DATA QUALIFIERS

U = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.

J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

D = Identifies all compounds identified in an analysis at a secondary dilution factor.

I = Interference.

NQ = Result qualitatively confirmed but not able to quantify.

A = Indicates that a TIC is a suspected aldol-condensation product.

N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.

X = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).

Y = Additional qualifiers used as required are explained in the case narrative.

GLOSSARY

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Suffix added to sample number to indicate that results are from a diluted analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP, Z	=	Indicates Spiked Compound.

TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quan modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quan modifications:

MP - Missed Peak: manually added peak not found by automatic quan program.

PA - Peak Assignment: quan report was changed to reflect correct peak assignment.

RI - Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.

SP - Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.

CB - Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.

PI - Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

Lionville Laboratory, Inc.
Volatiles by GC/MS, HSL List
Report Date: 03/18/03 15:10

RFW Batch Number: **0303L932** Client: **TNU-HANFORD F03-003** H2098 Work Order: 11343606001 Page: 1a

	Cust ID:	B16541	B16541	B16541	VBLKLM	VBLKLM BS
Sample Information	RFW#:	001	001 MS	001 MSD	03LVH048-MB1	03LVH048-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.04	0.980	0.980	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Toluene-d8	100 %	98 %	98 %	98 %	97 %
	Bromofluorobenzene	82 %	85 %	82 %	86 %	89 %
	1,2-Dichloroethane-d4	89 %	88 %	93 %	84 %	94 %
Chloromethane		11 U	10 U	10 U	10 U	10 U
Bromomethane		11 U	10 U	10 U	10 U	10 U
Vinyl Chloride		11 U	10 U	10 U	10 U	10 U
Chloroethane		11 U	10 U	10 U	10 U	10 U
Methylene Chloride		10	7	7	5 U	1 J
Acetone		11 U	10 U	10 U	10 U	10 U
Carbon Disulfide		6 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene		6 U	98 %	91 %	5 U	95 %
1,1-Dichloroethane		6 U	5 U	5 U	5 U	5 U
1,2-Dichloroethene (total)		6 U	5 U	5 U	5 U	5 U
Chloroform		6 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane		6 U	5 U	5 U	5 U	5 U
2-Butanone		11 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane		6 U	5 U	5 U	5 U	5 U
Carbon Tetrachloride		6 U	5 U	5 U	5 U	5 U
Bromodichloromethane		6 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane		6 U	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene		6 U	5 U	5 U	5 U	5 U
Trichloroethene		6 U	101 %	101 %	5 U	104 %
Dibromochloromethane		6 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane		6 U	5 U	5 U	5 U	5 U
Benzene		6 U	98 %	98 %	5 U	104 %
Trans-1,3-Dichloropropene		6 U	5 U	5 U	5 U	5 U
Bromoform		6 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone		11 U	10 U	10 U	10 U	10 U
2-Hexanone		11 U	10 U	10 U	10 U	10 U
Tetrachloroethene		6 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane		6 U	5 U	5 U	5 U	5 U
Toluene		6 U	104 %	101 %	5 U	104 %

*= Outside of EPA CLP QC limits.

RFW Batch Number: 0303L932 Client: TNU-HANFORD F03-003 Work Order: 11343606001 Page: 1b

	Cust ID:	B16541	B16541	B16541	VBLKLM	VBLKLM BS
	RFW#:	001	001 MS	001 MSD	03LVH048-MB1	03LVH048-MB1
Chlorobenzene		6 U	103 %	100 %	5 U	106 %
Ethylbenzene		6 U	5 U	5 U	5 U	5 U
Styrene		6 U	5 U	5 U	5 U	5 U
Xylene (total)		6 U	5 U	5 U	5 U	5 U

*= Outside of EPA CLP QC limits.

Lionville Laboratory Use Only

0303L932

Custody Transfer Record/Lab Work Request

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI LIONVILLE LABORATORY INC.

Client TNU- HANFORD SAF# F03-003

Est. Final Proj. Sampling Date

Project # 11343-606-001-9999.00

Project Contact/Phone #

Lionville Laboratory Project Manager OJ

QC SPEC Del STD TAT 30 days

Date Rec'd 3-13-03 Date Due 4-12-03

		A	B	C		D			E		F	G				
Refrigerator #		1	6	6		6			6		6	6				
#/Type Container	Liquid															
	Solid	1AG	1AG	1AG		1AG			1AG		1AG	1AG				
Volume	Liquid															
	Solid	250	250	250		250			250		500	60				
Preservatives		—	—	—		—			—		—	—				
ANALYSES REQUESTED →		ORGANIC				ALK			INORG							
		10L VOA	BNA	Pest/ PCB	Herb	Glycol Ketone			TCLP Metal	CN	TC ANIONS	pH				

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	Lionville Laboratory Use Only: 0624 H	0625 X ODRO	OPCD		OGCSC			ZCRG MET①		INORG①	IPH				
S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids L - EP/TCLP Leachate WI - Wipe X - Other F - Fish	001	B16541	✓	✓	S	3-11-03	1045	1	1	1		1			1		1	1				

Special Instructions: SAF # F03-003

DATE/REVISIONS:

MET① 1. As, Ba, Cd, Cr, Pb, Se, Ag, Be, Cu, Ni, V, Zn, Hg

INORG① 2. ICCL, ICFL, ICNO3, ICNO2, ICP04, ICSO4, IN3N2,

3. INH3N, ICNTO, ISFD

4.

5.

6.

Relinquished by	Received by	Date	Time
Fed Ex	V. Klinger	3/13/03	0955

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Lionville Laboratory Use Only

Samples were: 1) Shipped ___ or Hand Delivered ___

Airbill # See Below

2) Ambient or ~~Chilled~~

3) Received in Good Condition (Y) or N

4) Samples Properly Preserved (Y) or N

5) Received Within Holding Times (Y) or N

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES: 790229023746

Tamper Resistant Seal was:

1) Present on Outer Package (Y) or N

2) Unbroken on Outer Package (Y) or N

3) Present on Sample (Y) or N

4) Unbroken on Sample (Y) or N

COC Record Present Upon Sample Rec't (Y) or N

Cooler Temp. 1-3 °C

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-003-155	Page 1 of 1

Collector: Fahlberg/Johansen/Thomas	Company Contact: CS Cearlock — Telephone No. 373-3922	Project Coordinator: TRENT, SJ	Price Code 8N — Data Turnaround: 45 Days
Project Designation: 200 Area Source Characterization 200-CS-1 OU - Soil Sampl	Sampling Location: Borehole B8828 (100-102 ft)	SAF No.: F03-003	Air Quality ☐
Ice Chest No.: ERC 01-025	Field Logbook No.: HNF-N-3251 — COA ~~117514ES10~~ 118322ES10 JMS 3-6-03	Method of Shipment: Federal Express	
Shipped To: ~~EBERLINE SERVICES (Formerly TMA)~~ RECRA	Offsite Property No.: A030 164	Bill of Lading/Air Bill No.: 7902 2902 3746	

POSSIBLE SAMPLE HAZARDS/REMARKS
Radioactive
Tie To B15XM1

Special Handling and/or Storage
Cool 4°C

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None	None
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG	aG
No. of Container(s)	1	1	1	1	1	1	1 JMS 3-7-03	1	1
Volume	250mL	250mL	250mL	250mL	500mL	500mL	~~125mL~~ 60mL	1000mL	125mL
SAMPLE ANALYSIS	VOA - 8260A (TCL)	See item (1) in Special Instructions.	Alcohols, Glycols, & Ketones - 8015M (Add-on) {1-Propanol, Ethanol}	PCBs - 8082	See item (2) in Special Instructions.	See item (3) in Special Instructions.	pH (Soil) - 9045	See item (4) in Special Instructions.	Nickel-63; Technetium-99; Tritium - H3

JMS 3/6/03 (line drawn through last two columns)

Sample No.	Matrix *	Sample Date	Sample Time									
B16541	SOIL	3-11-03	1045	X	X	X	X	X	X	X		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
FH [signature]	3/11/03 1230	ERC R. Fahlberg	3/11/03 1230
R. Fahlberg	3-11-03 1230	3B 3728	3-11-03 1230
3B 3728	1000 3-12-03	R. Fahlberg	3-12-03 1000
ERC R. Fahlberg	3-12-03 1000	Fed Ex	
FedEx	3-13-03 0955	[signature]	3-13-03 0955

SPECIAL INSTRUCTIONS

Lab reports Decane as a TIC if detectable, and report diesel and kerosene range compounds from WTPH-D analysis. FH acknowledges that the holding time for Nitrate by EPA 300.0 or 9056 will not be met. Analyze pH within 24 hr of receipt.

(1) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(3) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; NO2/NO3 - 353.2; Ammonia - 350.3; Total Cyanide - 9010; Sulfides - 9030
~~(4) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Isotopic Uranium; Americium-241, Neptunium-237, Strontium-89,90 -- Total Sr; Total Uranium~~ JMS 3/6/03

Matrix *
S=Soil
SE=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

CLIENT: HANFORD

Purchase Order/Project:

DATE: 3-13-03

SAF# / SOW# / Release #: F03-003

Laboratory SDG #: 0303L932

NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1.	Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2.	Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3.	Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5.	Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6.	Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7.	All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8.	All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
10.	Shipment meets LvLJ Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
11.	Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12.	coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13.	coc will be faxed or emailed to client?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
14.	Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☐ N/A	☐ see Comment #

Cooler # / temp (°C) and Comments:

ERC-01-025 1-3°

Laboratory Sample Custodian:

Laboratory Project Manager:

Lionville Laboratory, Inc.
BNA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-003 H2098

DATE RECEIVED: 03/13/03 LVL LOT # :0303L932

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B16541	001	S	03LE0295	03/11/03	03/14/03	04/01/03
B16541	001 MS	S	03LE0295	03/11/03	03/14/03	04/01/03
LAB QC:						
SBLKPI	MB1	S	03LE0295	N/A	03/14/03	04/01/03
SBLKPI	MB1 BS	S	03LE0295	N/A	03/14/03	04/01/03

LIONVILLE LABORATORY INC.

Client: TNU-HANFORD F03-003
LVL #: 0303L932
SDG/SAF # H2098/F03-003

W.O. #: 11343-606-001-9999-00
Date Received: 03-13-2003

SEMIVOLATILE

One (1) soil sample was collected on 03-11-2003.

The sample and its associated QC samples were extracted according to Lionville Laboratory OPs based on method 3550 on 03-14-2003 and analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 04-01-2003.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from a sample that met LvLI's sample acceptance policy.

2. The sample was extracted and analyzed within required holding time.

3. Non-target compounds were detected in the sample.

4. All surrogate recoveries were within EPA QC limits.

5. All blank spike recoveries were within EPA QC limits.

6. All matrix spike recoveries were within EPA QC limits. The extract of matrix spike duplicate was lost during storage due to the cracked vial; consequently, the matrix spike sample has been analyzed and reported. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

7. Internal standard area and retention time criteria were met.

8. Manual integrations are performed according to OP 21-06A-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").

9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

by _____ 04-04-03

J. Michael Taylor — Date
President
Lionville Laboratory Incorporated

som\gorup\data\bna\tnu-hanford-0303-985.doc

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 03M5543

Initiator: Robert Carder
Date: 4/2/03
Client: TMI/Hanford F03w03

Batch: 03036932
Samples: 001T
Method: SW846/MCAWW/CLP/

Parameter: 0625X
Matrix: Soil
Prep Batch: 03LE0295

1. Reason for SDR

a. COC Discrepancy __ Tech Profile Error __ Client Request __ Sampler Error on C-O-C __ Transcription Error __ Wrong Test Code __ Other _____

b. General Discrepancy

__ Missing Sample/Extract* __ Container Broken __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample* __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

c. Problem (Include all relevant specific results; attach data if necessary)

Extract vial was cracked :. sample not dry prior to analysis

2. Known or Probable Causes(s)

3. Discussion and Proposed Action Other Description: Will report MS and BS

__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

4. Project Manager Instructions...signature/date: 4/2/03

__ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

5. Final Action...signature/date: 4/4/03 Other Explanation:

✓ Verified re-[log][leach][extract][digest][analysis] (circle)
✓ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Beegle
(1)	X Lab General Manager: Taylor	__	__ Inorganic: Perrone
(1)	X Project Mgr: Stone/Johnson/Haslett	__	__ GC/LC: Kiger
__	X Technical Mgr: Wesson/Daniels	(4)	X MS: Rychlak/Layman
__	X QA (file)	__	__ Log-in: Melnic
__	__ Data Management: Feldman	__	__ Admin: Soos
__	__ Sample Prep: Beegle/Kiger	__	__ Other: _____

GLOSSARY

DATA QUALIFIERS

U	=	Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
J	=	Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
B	=	This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
E	=	Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
D	=	Identifies all compounds identified in an analysis at a secondary dilution factor.
I	=	Interference.
NQ	=	Result qualitatively confirmed but not able to quantify.
A	=	Indicates that a TIC is a suspected aldol-condensation product.
N	=	Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
X	=	This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
Y	=	Additional qualifiers used as required are explained in the case narrative.

GLOSSARY

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Suffix added to sample number to indicate that results are from a diluted analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP, Z = Indicates Spiked Compound.

TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quan modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quan modifications:

MP - Missed Peak: manually added peak not found by automatic quan program.

PA - Peak Assignment: quan report was changed to reflect correct peak assignment.

RI - Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.

SP - Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.

CB - Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.

PI - Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, Special List — Report Date: 04/02/03 16:12

RFW Batch Number: **0303L932** — Client: **TNUHANFORD F03-003 H2098** — Work Order: 11343606001 — Page: 1a

	Cust ID:	B16541	B16541	SBLKPI	SBLKPI BS
Sample Information	RFW#:	001	001 MS	03LE0295-MB1	03LE0295-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Nitrobenzene-d5	75 %	85 %	82 %	83 %
	2-Fluorobiphenyl	81 %	90 %	85 %	89 %
	p-Terphenyl-d14	102 %	111 %	112 %	111 %
	Phenol-d5	71 %	83 %	81 %	79 %
	2-Fluorophenol	73 %	85 %	78 %	78 %
	2,4,6-Tribromophenol	82 %	96 %	84 %	89 %
		fl	fl	fl	fl fl fl
Phenol		350 U	79 %	330 U	73 %
bis(2-Chloroethyl)ether		350 U	350 U	330 U	330 U
2-Chlorophenol		350 U	82 %	330 U	76 %
1,3-Dichlorobenzene		350 U	350 U	330 U	330 U
1,4-Dichlorobenzene		350 U	75 %	330 U	74 %
1,2-Dichlorobenzene		350 U	350 U	330 U	330 U
2-Methylphenol		350 U	350 U	330 U	330 U
2,2'-oxybis(1-Chloropropane)		350 U	350 U	330 U	330 U
3- and/or 4-Methylphenol		350 U	350 U	330 U	330 U
N-Nitroso-Di-n-propylamine		350 U	84 %	330 U	78 %
Hexachloroethane		350 U	350 U	330 U	330 U
Nitrobenzene		350 U	350 U	330 U	330 U
Isophorone		350 U	350 U	330 U	330 U
2-Nitrophenol		350 U	350 U	330 U	330 U
2,4-Dimethylphenol		350 U	350 U	330 U	330 U
bis(2-Chloroethoxy)methane		350 U	350 U	330 U	330 U
2,4-Dichlorophenol		350 U	350 U	330 U	21 J
1,2,4-Trichlorobenzene		350 U	78 %	330 U	76 %
Naphthalene		350 U	350 U	330 U	330 U
4-Chloroaniline		350 U	350 U	330 U	330 U
Hexachlorobutadiene		350 U	350 U	330 U	330 U
4-Chloro-3-methylphenol		350 U	82 %	330 U	77 %
2-Methylnaphthalene		350 U	350 U	330 U	330 U
Hexachlorocyclopentadiene		350 U	350 U	330 U	330 U
2,4,6-Trichlorophenol		350 U	350 U	330 U	330 U
2,4,5-Trichlorophenol		860 U	860 U	840 U	840 U

*= Outside of EPA CLP QC limits.

Cust ID:	B16541		B16541		SBLKPI		SBLKPI BS	
RFW#:	001		001 MS		03LE0295-MB1		03LE0295-MB1	
2-Chloronaphthalene	350	U	350	U	330	U	330	U
2-Nitroaniline	860	U	860	U	840	U	840	U
Dimethylphthalate	350	U	350	U	330	U	330	U
Acenaphthylene	350	U	350	U	330	U	330	U
2,6-Dinitrotoluene	350	U	350	U	330	U	330	U
3-Nitroaniline	860	U	860	U	840	U	840	U
Acenaphthene	350	U	82	%	330	U	81	%
2,4-Dinitrophenol	860	U	860	U	840	U	840	U
4-Nitrophenol	860	U	88	%	840	U	92	%
Dibenzofuran	350	U	350	U	330	U	330	U
2,4-Dinitrotoluene	350	U	78	%	330	U	76	%
Diethylphthalate	350	U	350	U	330	U	330	U
4-Chlorophenyl-phenylether	350	U	350	U	330	U	330	U
Fluorene	350	U	350	U	330	U	330	U
4-Nitroaniline	860	U	860	U	840	U	840	U
4,6-Dinitro-2-methylphenol	860	U	860	U	840	U	840	U
N-Nitrosodiphenylamine (1)	350	U	350	U	330	U	330	U
4-Bromophenyl-phenylether	350	U	350	U	330	U	330	U
Hexachlorobenzene	350	U	350	U	330	U	330	U
Pentachlorophenol	860	U	84	%	840	U	85	%
Phenanthrene	350	U	350	U	330	U	330	U
Anthracene	350	U	350	U	330	U	330	U
Carbazole	350	U	350	U	330	U	330	U
Di-n-Butylphthalate	44	J	350	U	330	U	330	U
Fluoranthene	350	U	350	U	330	U	330	U
Pyrene	350	U	100	%	330	U	100	%
Butylbenzylphthalate	350	U	350	U	330	U	330	U
3,3'-Dichlorobenzidine	350	U	350	U	330	U	330	U
Benzo(a)anthracene	350	U	350	U	330	U	330	U
Chrysene	350	U	350	U	330	U	330	U
bis(2-Ethylhexyl)phthalate	350	U	350	U	330	U	330	U
Di-n-Octyl phthalate	350	U	350	U	330	U	330	U
Benzo(b)fluoranthene	350	U	350	U	330	U	330	U
Benzo(k)fluoranthene	350	U	350	U	330	U	330	U
Benzo(a)pyrene	350	U	350	U	330	U	330	U
Indeno(1,2,3-cd)pyrene	350	U	350	U	330	U	330	U
Dibenzo(a,h)anthracene	350	U	350	U	330	U	330	U
Benzo(g,h,i)perylene	350	U	350	U	330	U	330	U
Tributylphosphate	350	U	350	U	330	U	330	U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B16541

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

Client: TNUHANFORD F03-003 H2098

Matrix: (soil/water) SOIL

Lab Sample ID: 0303L932-001

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: A040113

Level: (low/med) LOW

Date Received: 03/13/03

% Moisture: 4 decanted: (Y/N)

Date Extracted: 03/14/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 04/01/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH: 7.0

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		ALDOL CONDENSATE	5.823	100	JAB
2.		ALDOL CONDENSATE	6.376	10000	JAB
3.	79-34-5	1,1,2,2-TETRACHLOROETHANE	7.832	90	JNB

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKPI

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

Client: TNUHANFORD F03-003 H2098

Matrix: (soil/water) SOIL

Lab Sample ID: 03LE0295-MB1

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: A040111

Level: (low/med) LOW

Date Received: 03/14/03

% Moisture: _____ decanted: (Y/N)__

Date Extracted: 03/14/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 04/01/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH: 7.0

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		ALDOL CONDENSATE	5.828	100	JA
2.		ALDOL CONDENSATE	6.380	10000	JA
3.	79-34-5	1,1,2,2-TETRACHLOROETHANE	7.829	90	JN

Lionville Laboratory Use Only
03031932

Custody Transfer Record/Lab Work Request

LVLI LIONVILLE LABORATORY INC.

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client TNU-HANFORD SAF# F03-003
Est. Final Proj. Sampling Date
Project # 11343-606-001-9999.00
Project Contact/Phone #
Lionville Laboratory Project Manager OJ
QC SPEC Del STD TAT 30 days
Date Rec'd 3-13-03 Date Due 4-12-03

	A	B	C		D		E		F	G
Refrigerator #	1	6	6		6		6		6	6
#/Type Container Liquid										
#/Type Container Solid	1AG	1AG	1AG		1AG		1AG		1AG	1AG
Volume Liquid										
Volume Solid	250	250	250		250		250		500	60
Preservatives	—	—	—		—		—		—	—
ANALYSES REQUESTED	TCL VOA	BNA	Pest/PCB	Herb	ALK Glycol Ketone		ICP Metal	CN	IC Anions	PH

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	0624H	0625X ODRO	OPCD		OGCSC		ZCRG MET①		INORG①	IPH
001	B16541	✓	✓	S	3-11-03	1045	1	1	1		1		1	1	1	1

Special Instructions: SAF # F03-003

DATE/REVISIONS:
MET① 1. As, Ba, Cd, Cr, Pb, Se, Ag, Be, Cu, Ni, V, Zn, Hg
INORG① 2. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4, IN3N2,
3. INH3N, ICNTO, ISFD
4.
5.
6.

Lionville Laboratory Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___ Airbill # See Below
2) Ambient or Chilled (circled)
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 1-3 °C

Relinquished by	Received by	Date	Time
[signature]	[signature]	3/13/03	0955

Relinquished by	Received by	Date	Time
COMPOSITE WASTE		ORIGINAL REWRITTEN	

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES: 790229023746

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F03-003-155	Page 1 of 1
Collector: Fahlberg/Johansen/Thomas	Company Contact: CS Cearlock	Telephone No.: 373-3922	Project Coordinator: TRENT, SJ	Price Code 8N; Data Turnaround 45 Days
Project Designation: 200 Area Source Characterization 200-CS-1 OU - Soil Sampl	Sampling Location: Borehole B8828 (100-102 ft)		SAF No.: F03-003	Air Quality ☐
Ice Chest No.: ERC 01-025	Field Logbook No.: HNF-N-3251	COA ~~117514ES10~~ 118322ES10 TMS 3-6-03	Method of Shipment: Federal Express	
Shipped To: ~~EBERLINE SERVICES (Formerly TMA)~~ RECRA	Offsite Property No.: A030 164		Bill of Lading/Air Bill No.: 7902 2902 3746	

POSSIBLE SAMPLE HAZARDS/REMARKS
Radioactive
Tie To B15XM1

Special Handling and/or Storage
Cool 4°C

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None	None	
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG	~~aG~~	
No. of Container(s)	1	1	1	1	1	1	1	1	~~1~~	
Volume	250mL	250mL	250mL	250mL	500mL	500mL	~~125mL~~ 60mL TMS 3-7-03	1000mL	~~125mL~~	
SAMPLE ANALYSIS	VOA - 8260A (TCL)	See item (1) in Special Instructions.	Alcohols, Glycols, & Ketones - 8015M (Add-on) (1-Propanol, Ethanol)	PCBs - 8082	See item (2) in Special Instructions.	See item (3) in Special Instructions.	pH (Soil) - 9045	~~See item (4) in Special Instructions.~~	~~Nickel-63; Technetium-99; Tritium - H3~~	

TMS 3/6/03

Sample No.	Matrix *	Sample Date	Sample Time										
B16541	SOIL	3-11-03	1045	X	X	X	X	X	X	X			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
FH [signature] MW Johansen	3/11/03 1230	ERC R. Fahlberg R. Fahlberg	3/11/03 1230
R. Fahlberg R. Fahlberg	3-11-03 1230	3B 3728	3-11-03 1230
3B 3728	1000 3-12-03	R. Fahlberg R. Fahlberg	3-12-03 1000
ERC R. Fahlberg R. Fahlberg	3-12-03 1000	Fed Ex	
Fed Ex	3-13-03 0955	[signature]	3-13-03 0955

SPECIAL INSTRUCTIONS
Lab reports Decane as a TIC if detectable, and report diesel and kerosene range compounds from WTPH-D analysis. FH acknowledges that the holding time for Nitrate by EPA 300.0 or 9056 will not be met. Analyze pH within 24 hr of receipt.

(1) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(3) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; NO2/NO3 - 353.2; Ammonia - 350.3; Total Cyanide - 9010; Sulfides - 9030
~~(4) Gross Alpha, Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Isotopic Uranium, Americium-241, Neptunium-237, Strontium-89,90 -- Total Sr, Total Uranium~~

TMS 3/6/03

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

CLIENT: HANFORD

Purchase Order/Project:

DATE: 3-13-03

SAF# / SOW# / Release #: F03-003

Laboratory SDG #: 0303L932

NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1.	Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2.	Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3.	Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5.	Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6.	Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7.	All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8.	All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
10.	Shipment meets LvL1 Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
11.	Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12.	coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13.	coc will be faxed or emailed to client?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
14.	Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☐ N/A	☐ see Comment #

Cooler # / temp (°C) and Comments:

IRC-01-025 1-3°

Laboratory Sample Custodian: [signature]

Laboratory Project Manager:

13

Lionville Laboratory, Inc.
GCSC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-003 H2098

DATE RECEIVED: 03/13/03 LVL LOT # :0303L932

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B16541	001	S	03LE0349	03/11/03	03/24/03	03/25/03
B16541	001 MS	S	03LE0349	03/11/03	03/24/03	03/25/03
B16541	001 MSD	S	03LE0349	03/11/03	03/24/03	03/25/03
LAB QC:						
BLK	MB1	S	03LE0349	N/A	03/24/03	03/25/03
BLK	MB1 BS	S	03LE0349	N/A	03/24/03	03/25/03
BLK	MB1 BSD	S	03LE0349	N/A	03/24/03	03/25/03

4/13/03

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU HANFORD F03-003
LVL#: 0303L932
SDG/SAF#: H2098/F03-003

W.O.#: 11343-606-001-9999-00
Date Received: 03-13-03

GC SCAN

One (1) soil sample was collected on 03-11-03.

The sample and its associated QC samples were prepped on 03-24-03 and analyzed on 03-25-03 according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures based on method 8015B for n-Propyl Alcohol and Ethanol.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.

2. All required holding times for analysis have been met.

3. The method blank was below the reporting limits for all target compounds.

4. Surrogates are not currently employed in the methodology.

5. All blank spike recoveries were within acceptance criteria.

6. All matrix spike recoveries were within acceptance criteria.

7. All initial calibrations were within acceptance criteria.

8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

4/4/03
Date

r:\group\data\gcsc\03L-932.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 8 pages.

GLOSSARY OF GC SCAN DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

GLOSSARY OF GC SCAN DATA

P = This flag is used for an GC SCAN target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".

D = This flag identifies all compounds identified in an analysis at a secondary dilution factor.

C = This flag applies to a compound that has been confirmed by GC SCAN.

Lionville Laboratory, Inc.

GC SCAN

Report Date: 04/02/03 09:57

RFW Batch Number: **0303L932** Client: **TNUHANFORD F03-003 H2098** Work Order: 11343606001 Page: 1

	Cust ID:	B16541	B16541	B16541	BLK	BLK BS	BLK BSD
Sample Information	RFW#:	001	001 MS	001 MSD	03LE0349-MB1	03LE0349-MB1	03LE0349-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg

	fl		fl		fl		fl		fl		fl
n-Propyl Alcohol	26	U	90	%	93	%	25	U	92	%	96	%
Ethanol	26	U	102	%	106	%	25	U	104	%	107	%

4/2/03

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Lionville Laboratory Use Only

03031932

Custody Transfer Record/Lab Work Request

Page ___ of ___

LVLI LIONVILLE LABORATORY INC.

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client TNU- HANFORD SAF# F03-003

Est. Final Proj. Sampling Date

Project # 1343-606-001-9999-00

Project Contact/Phone #

Lionville Laboratory Project Manager OJ

QC SPEC Del STD TAT 30 days

Date Rec'd 3-13-03 Date Due 4-12-03

		A	B	C	D	E	F	G
Refrigerator #		1	6	6	6	6	6	6
#/Type Container	Liquid							
	Solid	1AG	1AG	1AG	1AG	1AG	1AG	1AG
Volume	Liquid							
	Solid	250	250	250	250	250	300	60
Preservatives		—	—	—	—	—	—	—

ANALYSES REQUESTED → ORGANIC: TCL VOA; BNA; Pest/PCB; Herb; ALK Glycol/Ketone. INORG: TCP Metal; CN; IC Anions; PH

MATRIX CODES	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	Lionville Laboratory Use Only: 0624 H	0625 x ODRO	OPCD	OGCSC	ICRG MET ①		INORG ①	ZPH
S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - EP/TCLP Leachate; WI - Wipe; X - Other; F - Fish	001	B16541	✓	✓	S	3-11-03	1045	1	1	1	1	1		1	1

Special Instructions: SAF # F03-003

DATE/REVISIONS:

MET ① 1. As, Ba, Cd, Cr, Pb, Se, Ag, Be, Cu, Ni, V, Zn, Hg

INORG ① 2. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4, IN3N2,

3. INH3N, ICNTO, ISFD

4.

5.

6.

Lionville Laboratory Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___ Airbill # See Below

2) Ambient or (Chilled)

3) Received in Good Condition (Y) or N

4) Samples Properly Preserved (Y) or N

5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was: 1) Present on Outer Package (Y) or N; 2) Unbroken on Outer Package (Y) or N; 3) Present on Sample (Y) or N; 4) Unbroken on Sample (Y) or N

COC Record Present Upon Sample Rec't (Y) or N

Cooler Temp. 1-3 °C

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	3/13/03	0955

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES: 7902 2902 3746

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-003-155	Page 1 of 1

Collector Fahlberg/Johansen/Thomas	Company Contact CS Cearlock	Telephone No. 373-3922	Project Coordinator TRENT, SJ
Project Designation 200 Area Source Characterization 200-CS-1 OU - Soil Sampl	Sampling Location Borehole B8828 (100-102 ft)		SAF No. F03-003
Ice Chest No. ERC 01-025	Field Logbook No. HNF-N-3251	COA ~~117514ES10~~ 118322ES10 (initialed 3-6-03)	Method of Shipment Federal Express
Shipped To ~~EBERLINE SERVICES (Formerly TMA)~~ RECRA	Offsite Property No. A030 164		Bill of Lading/Air Bill No. 7902 2902 3746

Price Code 8N | Data Turnaround 45 Days | Air Quality ☐

POSSIBLE SAMPLE HAZARDS/REMARKS
Radioactive
Tie To B15XM1

Special Handling and/or Storage
Cool 4°C

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None	None
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG	aG
No. of Container(s)	1	1	1	1	1	1	1 (mo3-7-03)	1	1
Volume	250mL	250mL	250mL	250mL	500mL	500mL	~~125mL~~ 60mL	1000mL	125mL
SAMPLE ANALYSIS	VOA - 8260A (TCL)	See item (1) in Special Instructions.	Alcohols, Glycols, & Ketones - 8015M (Add-on) {1-Propanol, Ethanol}	PCBs - 8082	See item (2) in Special Instructions.	See item (3) in Special Instructions.	pH (Soil) - 9045	See item (4) in Special Instructions.	Nickel-63; Technetium-99; Tritium - H3

(Last two columns struck through, initialed 3/6/03)

Sample No.	Matrix *	Sample Date	Sample Time									
B16541	SOIL	3-11-03	1045	X	X	X	X	X	X	X		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
FH [signature]	3/11/03 1230	ERC R. Fahlberg R. Fahlberg	3/11/03 1230
R. Fahlberg R. Fahlberg	3-11-03 1230	3B 3728	3-11-03 1230
3B 3728	1000 3-12-03	R. Fahlberg R. Fahlberg	3-12-03 1000
ERC R. Fahlberg R. Fahlberg	3-12-03 1000	Fed Ex	
Fed Ex	3-13-03 0955	[signature]	3-13-03 0955

SPECIAL INSTRUCTIONS
Lab reports Decane as a TIC if detectable, and report diesel and kerosene range compounds from WTPH-D analysis. FH acknowledges that the holding time for Nitrate by EPA 300.0 or 9056 will not be met. Analyze pH within 24 hr of receipt.

(1) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(3) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; NO2/NO3 - 353.2; Ammonia - 350.3; Total Cyanide - 9010; Sulfides - 9030
~~(4) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Isotopic Uranium; Americium-241; Neptunium-237; Strontium-89,90 -- Total Sr; Total Uranium~~ (initialed 3/6/03)

Matrix *
S=Soil
SE=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wl=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

CLIENT: HANFORD

Purchase Order/Project:

DATE: 3-13-03

SAF# / SOW# / Release #: F03-003

Laboratory SDG #: 0303C932

NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1.	Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2.	Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3.	Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5.	Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6.	Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7.	All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8.	All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
10.	Shipment meets LvL1 Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
11.	Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12.	coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13.	coc will be faxed or emailed to client?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
14.	Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☐ N/A	☐ see Comment #

Cooler # / temp (°C) and Comments:

ERC-01-025 1-3°

Laboratory Sample Custodian:

Laboratory Project Manager:

Lionville Laboratory, Inc.
DRO ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-003 H2098

DATE RECEIVED: 03/13/03 LVL LOT # :0303L932

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B16541	001	S	03LE0352	03/11/03	03/25/03	04/02/03
B16541	001 MS	S	03LE0352	03/11/03	03/25/03	04/02/03
B16541	001 MSD	S	03LE0352	03/11/03	03/25/03	04/02/03
LAB QC:						
BLK	MB1	S	03LE0352	N/A	03/25/03	04/02/03
BLK	MB1 BS	S	03LE0352	N/A	03/25/03	04/02/03

4/7/03

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD F03-003
LVL #: 0303L932
SDG/SAF # H2098/F03-003

W.O. #: 11343-606-001-9999-00
Date Received: 03-13-2003

DIESEL RANGE ORGANICS

One (1) soil sample was collected on 03-11-2003.

The sample and its associated QC samples were extracted on 03-25-2003 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 04-02-2003. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8015B. The analysis met the intent of method WTPH-D.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from a sample that met LvLI's sample acceptance policy.

2. The required holding time for extraction and analysis has been met.

3. The method blank was below the reporting limits for all target compounds.

4. All surrogate recoveries were within acceptance criteria.

5. The blank spike recovery was within acceptance criteria.

6. The matrix spike recoveries were within acceptance criteria.

7. All initial calibrations associated with this data set were within acceptance criteria.

8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

4/8/03
Date

som\r:\group\data\dro\tnu hanford\0303-932.doc

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

GLOSSARY OF DIESEL RANGE ORGANICS DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

GLOSSARY OF DIESEL RANGE ORGANICS DATA

D = This flag identifies all compounds identified in an analysis at a secondary dilution factor.

C = This flag applies to a compound that has been confirmed by GC/MS.

Lionville Laboratory, Inc.

DIESEL RANGE ORGANICS BY GC

Report Date: 04/09/03 14:11

RFW Batch Number: **0303L932** Client: **TNUHANFORD F03-003 H2098** Work Order: 11343606001 Page: 1

	Cust ID:	B16541	B16541	B16541	BLK	BLK BS
Sample Information	RFW#:	001	001 MS	001 MSD	03LE0352-MB1	03LE0352-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
p-Terphenyl		89 %	109 %	95 %	91 %	90 %
Diesel Range Organics		12.5 U	86 %	80 %	12.0 U	71 %
Kerosene		12.5 U	12.5 U	12.5 U	12.0 U	12.0 U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Lionville Laboratory Use Only

03031932

Custody Transfer Record/Lab Work Request

Page 1 of 1

LVLI LIONVILLE LABORATORY INC.

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client TTNU - HANFORD SAF# F03-003

Est. Final Proj. Sampling Date

Project # 11343-606-001-9999.00

Project Contact/Phone #

Lionville Laboratory Project Manager OJ

QC SPEC Del STD TAT 30 days

Date Rec'd 3-13-03 Date Due 4-12-03

		A	B	C		D			E		F	G				
Refrigerator #		1	6	6		6			6		6	6				6
#/Type Container	Liquid															
	Solid	1AG	1AG	1AG		1AG			1AG		1AG	1AG				
Volume	Liquid															
	Solid	250	250	250		250			250		500	60				
Preservatives		—	—	—		—			—		—	—				

ANALYSES REQUESTED → ORGANIC: TCL VOA; BNA; Pest/PCB; Herb; ALK Glycol Acidity. INORG: TCLP Metal; CN; IC Anions; PH

Lionville Laboratory Use Only

MATRIX CODES	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	0624 H	0625 x ODRO	OPCD		OGCSC			ICRP MET ①		INORG ①	IPH				
S - Soil, SE - Sediment, SO - Solid, SL - Sludge, W - Water, O - Oil, A - Air, DS - Drum Solids, DL - Drum Liquids, L - EP/TCLP Leachate, WI - Wipe, X - Other, F - Fish	001	B16541	✓	✓	S	3-11-03	1045	1	1	1		1			1		1	1				

Special Instructions: SAF # F03-003

DATE/REVISIONS:

MET ① 1. As, Ba, Cd, Cr, Pb, Se, Ag, Be, Cu, Ni, V, Zn, Hg

INORG ① 2. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4, IN3N2,

3. INH3N, ICNTO, ISFD

4.

5.

6.

Lionville Laboratory Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___ Airbill # See Below

2) Ambient or (Chilled)

3) Received in Good Condition (Y) or N

4) Samples Properly Preserved (Y) or N

5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was: 1) Present on Outer Package (Y) or N; 2) Unbroken on Outer Package (Y) or N; 3) Present on Sample (Y) or N; 4) Unbroken on Sample (Y) or N

COC Record Present Upon Sample Rec't (Y) or N

Cooler Temp. 1-3 °C

Relinquished by	Received by	Date	Time
Fed Ex	[signature]	3/13/03	0955

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES: 790229023746

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-003-155	Page 1 of 1
Collector: Fahlberg/Johansen/Thomas	Company Contact: CS Cearlock; Telephone No.: 373-3922	Project Coordinator: TRENT, SJ	Price Code: 8N; Data Turnaround: 45 Days
Project Designation: 200 Area Source Characterization 200-CS-1 OU - Soil Sampl	Sampling Location: Borehole B8828 (100-102 ft)	SAF No.: F03-003	Air Quality ☐
Ice Chest No.: ERC 01-025	Field Logbook No.: HNF-N-3251; COA ~~H7514ES10~~ 118322ES10 TMS 3-6-03	Method of Shipment: Federal Express	
Shipped To: ~~EBERLINE SERVICES (Formerly TMA)~~ RECRA	Offsite Property No.: A030 164	Bill of Lading/Air Bill No.: 7902 2902 3746	

POSSIBLE SAMPLE HAZARDS/REMARKS
Radioactive
Tie To B15XM1

Special Handling and/or Storage
Cool 4°C

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None	None
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG	aG
No. of Container(s)	1	1	1	1	1	1	1 TMS 3-7-03	1	1
Volume	250mL	250mL	250mL	250mL	500mL	500mL	~~125mL~~ 60mL	1000mL	125mL
SAMPLE ANALYSIS	VOA - 8260A (TCL)	See item (1) in Special Instructions.	Alcohols, Glycols, & Ketones - 8015M (Add-on) {1-Propanol, Ethanol}	PCBs - 8082	See item (2) in Special Instructions.	See item (3) in Special Instructions.	pH (Soil) - 9045	See item (4) in Special Instructions.	Nickel-63; Technetium-99; Tritium - H3

(Last two columns struck through: TMS 3/6/03)

Sample No.	Matrix *	Sample Date	Sample Time									
B16541	SOIL	3-11-03	1045	X	X	X	X	X	X	X		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
FH — M Johansen M Johansen	3/11/03 1230	ERC — R Fahlberg R. Fahlberg	3/11/03 1230
R. Fahlberg R. Fahlberg	3-11-03 1230	3B 3728	3-11-03
3B 3728	1000 3-12-03	R. Fahlberg R. Fahlberg	3-12-03 1000
ERC — R. Fahlberg R. Fahlberg	3-12-03 1000	Fed Ex	
Fed Ex	3-13-03 0955	[signature]	3-13-03 0955

SPECIAL INSTRUCTIONS
Lab reports Decane as a TIC if detectable, and report diesel and kerosene range compounds from WTPH-D analysis. FH acknowledges that the holding time for Nitrate by EPA 300.0 or 9056 will not be met. Analyze pH within 24 hr of receipt.

(1) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(3) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; NO2/NO3 - 353.2; Ammonia - 350.3; Total Cyanide - 9010; Sulfides - 9030
~~(4) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Isotopic Uranium; Americium-241; Neptunium-237; Strontium-89,90 - Total Sr; Total Uranium~~ TMS 3/6/03

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

CLIENT: HANFORD

Purchase Order/Project:

DATE: 3-13-03

SAF# / SOW# / Release #: F03-003

Laboratory SDG #: 0303C932

NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1.	Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2.	Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3.	Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5.	Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6.	Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7.	All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8.	All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
10.	Shipment meets LvLl Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
11.	Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12.	coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13.	coc will be faxed or emailed to client?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
14.	Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☐ N/A	☐ see Comment #

Cooler # / temp (°C) and Comments:

C-01-025 1-3°

Laboratory Sample Custodian:

Laboratory Project Manager:

Lionville Laboratory, Inc.
PCB ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-003 H2098

DATE RECEIVED: 03/13/03 LVL LOT # :0303L932

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B16541	001	S	03LE0296	03/11/03	03/14/03	03/27/03
B16541	001 MS	S	03LE0296	03/11/03	03/14/03	03/27/03
B16541	001 MSD	S	03LE0296	03/11/03	03/14/03	03/27/03
LAB QC:						
PBLKOM	MB1	S	03LE0296	N/A	03/14/03	03/27/03
PBLKOM	MB1 BS	S	03LE0296	N/A	03/14/03	03/27/03

4/7/03

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD F03-003
LVL #: 0303L932
SDG/SAF # H2098/F03-003

W.O. #: 11343-606-001-9999-00
Date Received: 03-13-2003

PCB

One (1) soil sample was collected on 03-11-2003.

The sample and its associated QC samples were extracted on 03-14-2003 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 03-27-2003. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8082 for Aroclors only.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from a sample that met LvLI's sample acceptance policy.
2. The required holding time for extraction and analysis has been met.
3. The sample and its associated QC samples received a Sulfuric Acid cleanup.
4. The method blank was below the reporting limits for all target compounds.
5. All surrogate recoveries were within acceptance criteria.
6. The blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. All initial calibrations associated with this data set were within acceptance criteria.
9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

4/7/03
Date

som\r:\group\data\pest\tnu hanford\0303-932.pcb

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

GLOSSARY OF PESTICIDE/PCB DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

GLOSSARY OF PESTICIDE/PCB DATA

P = This flag is used for an PESTICIDE/PCB target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".

D = This flag identifies all compounds identified in an analysis at a secondary dilution factor.

C = This flag applies to a compound that has been confirmed by GC/MS.

Lionville Laboratory, Inc.

PCBs by GC

Report Date: 04/04/03 15:20

RFW Batch Number: **0303L932** Client: **TNUHANFORD F03-003 H2098** Work Order: 11343606001 Page: 1

	Cust ID:	B16541	B16541	B16541	PBLKOM	PBLKOM BS
Sample Information	RFW#:	001	001 MS	001 MSD	03LE0296-MB1	03LE0296-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate: Tetrachloro-m-xylene		75 %	80 %	80 %	80 %	85 %
Decachlorobiphenyl		95 %	110 %	105 %	100 %	105 %
Aroclor-1016		35 U	80 %	87 %	33 U	83 %
Aroclor-1221		69 U	69 U	69 U	67 U	67 U
Aroclor-1232		35 U	35 U	35 U	33 U	33 U
Aroclor-1242		35 U	35 U	35 U	33 U	33 U
Aroclor-1248		35 U	35 U	35 U	33 U	33 U
Aroclor-1254		35 U	35 U	35 U	33 U	33 U
Aroclor-1260		35 U	99 %	97 %	33 U	95 %

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Lionville Laboratory Use Only

03031932

Custody Transfer Record/Lab Work Request

Page 1 of

LVL LIONVILLE LABORATORY INC.

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU - HANFORD SAF# F03-003

Est. Final Proj. Sampling Date:

Project #: 11343-606-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: OJ

QC: SPEC Del: STD TAT: 30 days

Date Rec'd: 3-13-03 Date Due: 4-12-03

		A	B	C		D			E		F	G				
Refrigerator #		1	6	6		6			6		6	6				
#/Type Container	Liquid															
	Solid	1AG	1AG	1AG		1AG			1AG		1AG	1AG				
Volume	Liquid															
	Solid	250	250	250		250			250		300	60				
Preservatives		—	—	—		—			—		—	—				
ANALYSES REQUESTED →		ORGANIC				ALK Glycol Ketone			INORG							
		TCL VOA	BNA	Pest/ PCB	Herb				TCP Metal	CN	TC Anions	PH				
		Lionville Laboratory Use Only														
		0624 H2O	0625 x ODRO	OPCD		OGCSC			ZERO MET ①		INORG ①	IPH				

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected															
S - Soil, SE - Sediment, SO - Solid, SL - Sludge, W - Water, O - Oil, A - Air, DS - Drum Solids, DL - Drum Liquids, L - EP/TCLP Leachate, WI - Wipe, X - Other, F - Fish	001	B16541	✓	✓	S	3-11-03	1045	1	1	1		1			1	for	1	1				

Special Instructions: SAF # F03-003

DATE/REVISIONS:

MET ① 1. As, Ba, Cd, Cr, Pb, Se, Ag, Be, Cu, Ni, V, Zn, Hg

INORG ① 2. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4, IN3N2,

3. INH3N, ICNTO, ISFD

4.

5.

6.

Lionville Laboratory Use Only

Samples were: 1) Shipped / or Hand Delivered — Airbill # See Below

2) Ambient or Chilled

3) Received in Good Condition (Y) or N

4) Samples Properly Preserved (Y) or N

5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was: 1) Present on Outer Package (Y) or N; 2) Unbroken on Outer Package (Y) or N; 3) Present on Sample (Y) or N; 4) Unbroken on Sample (Y) or N

COC Record Present Upon Sample Rec't (Y) or N

Cooler Temp. 1-3 °C

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES: 790229023746

Relinquished by	Received by	Date	Time
Fed Ex	[signature]	3/13/03	0955

Relinquished by	Received by	Date	Time
COMPOSITE WASTE		ORIGINAL REWRITTEN	

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F03-003-155	Page 1 of 1
Collector Fahlberg/Johansen/Thomas	Company Contact CS Cearlock	Telephone No. 373-3922	Project Coordinator TRENT, SJ	Price Code 8N Air Quality ☐
Project Designation 200 Area Source Characterization 200-CS-1 OU - Soil Sampl	Sampling Location Borehole B8828 (100-102 ft)		SAF No. F03-003	Data Turnaround 45 Days
Ice Chest No. FRC 01-025	Field Logbook No. HNF-N-3251	COA JMS 3-6-03 ~~11514ES10~~ 11832ES10	Method of Shipment Federal Express	
Shipped To ~~EBERLINE SERVICES (Formerly TMA)~~ RCRA	Offsite Property No. F7030 164		Bill of Lading/Air Bill No. 7902 2902 3746	

POSSIBLE SAMPLE HAZARDS/REMARKS
Radioactive

Special Handling and/or Storage
T: < T0 B15 XM1
Cool 4°C

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None	None	
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG	aG	
No. of Container(s)	1	1	1	1	1	1	1 mo3-7-03	1	1	
Volume	250mL	250mL	250mL	250mL	500mL	500mL	~~125mL~~ 60mL	1000mL	125mL	
SAMPLE ANALYSIS	VOA - 8260A (TCL)	See item (1) in Special Instructions.	Alcohols, Glycols, & Ketones - 8015M (Add-on) {i-Propanol, Ethanol}	PCBs - 8082	See item (2) in Special Instructions.	See item (3) in Special Instructions.	pH (Soil) - 9045	See item (4) in Special Instructions.	Nickel-63; Technetium-99; Tritium - H3	

Sample No.	Matrix *	Sample Date	Sample Time									
B16541	SOIL	3-11-03	1045	X	X	X	X	X	X	X	X	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[illegible] EH	3/11/03 1230	FRC R.Fahlberg	3/11/03 1230
R.Fahlberg R.Fahlberg	3.11.03 1230	3B 3728	3.11.03 1230
3B 3728	3.12.03 1000	R.Fahlberg R.Fahlberg	3.12.03 1000
R.Fahlberg R.Fahlberg	3.12.03	Fed Ex	
Fed Ex	3-13-03 0955	[illegible]	3-13-03 0955

SPECIAL INSTRUCTIONS

Lab reports Decane as a TIC if detectable, and report diesel and kerosene range compounds from WTPH-D analysis. FH acknowledges that the holding time for Nitrate by EPA 300.0 or 9056 will not be met. Analyze pH within 24 hr of receipt.

(1) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(3) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; NO2/NO3 - 353.2; Ammonia - 350.3; Total Cyanide - 9010; Sulfides - 9030
~~(4) Gross Alpha, Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Radium-228}; Isotopic Plutonium, Isotopic Thorium {Thorium-232}; Isotopic Uranium, Americium-241, Neptunium-237, Strontium-89,90 - Total Sr, Total Uranium~~

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
O=Other

3/11/03

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

CLIENT: HANFORD

Purchase Order/Project:

DATE: 3-13-03

SAF# / SOW# / Release #: F03-003

Laboratory SDG #: 0303C932

NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1. Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2. Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3. Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4. All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5. Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6. Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7. All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8. All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9. Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
10. Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
11. Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12. coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13. coc will be faxed or emailed to client?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
14. Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☐ N/A	☐ see Comment #

Cooler # / temp (°C) and Comments:

C-01-025 1-3°

Laboratory Sample Custodian: [signature]

Laboratory Project Manager:

8

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-003 H2098

DATE RECEIVED: 03/13/03 LVL LOT # :0303L932

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B16541						
SILVER, TOTAL	001	S	03L0151	03/11/03	03/20/03	03/25/03
SILVER, TOTAL	001 REP	S	03L0151	03/11/03	03/20/03	03/25/03
SILVER, TOTAL	001 MS	S	03L0151	03/11/03	03/20/03	03/25/03
ARSENIC, TOTAL	001	S	03L0151	03/11/03	03/20/03	03/25/03
ARSENIC, TOTAL	001 REP	S	03L0151	03/11/03	03/20/03	03/25/03
ARSENIC, TOTAL	001 MS	S	03L0151	03/11/03	03/20/03	03/25/03
BARIUM, TOTAL	001	S	03L0151	03/11/03	03/20/03	03/25/03
BARIUM, TOTAL	001 REP	S	03L0151	03/11/03	03/20/03	03/25/03
BARIUM, TOTAL	001 MS	S	03L0151	03/11/03	03/20/03	03/25/03
BERYLLIUM, TOTAL	001	S	03L0151	03/11/03	03/20/03	03/25/03
BERYLLIUM, TOTAL	001 REP	S	03L0151	03/11/03	03/20/03	03/25/03
BERYLLIUM, TOTAL	001 MS	S	03L0151	03/11/03	03/20/03	03/25/03
CADMIUM, TOTAL	001	S	03L0151	03/11/03	03/20/03	03/25/03
CADMIUM, TOTAL	001 REP	S	03L0151	03/11/03	03/20/03	03/25/03
CADMIUM, TOTAL	001 MS	S	03L0151	03/11/03	03/20/03	03/25/03
CHROMIUM, TOTAL	001	S	03L0151	03/11/03	03/20/03	03/25/03
CHROMIUM, TOTAL	001 REP	S	03L0151	03/11/03	03/20/03	03/25/03
CHROMIUM, TOTAL	001 MS	S	03L0151	03/11/03	03/20/03	03/25/03
COPPER, TOTAL	001	S	03L0151	03/11/03	03/20/03	03/25/03
COPPER, TOTAL	001 REP	S	03L0151	03/11/03	03/20/03	03/25/03
COPPER, TOTAL	001 MS	S	03L0151	03/11/03	03/20/03	03/25/03
MERCURY, TOTAL	001	S	03C0058	03/11/03	03/24/03	03/24/03
MERCURY, TOTAL	001 REP	S	03C0058	03/11/03	03/24/03	03/24/03
MERCURY, TOTAL	001 MS	S	03C0058	03/11/03	03/24/03	03/24/03
NICKEL, TOTAL	001	S	03L0151	03/11/03	03/20/03	03/25/03
NICKEL, TOTAL	001 REP	S	03L0151	03/11/03	03/20/03	03/25/03
NICKEL, TOTAL	001 MS	S	03L0151	03/11/03	03/20/03	03/25/03
LEAD, TOTAL	001	S	03L0151	03/11/03	03/20/03	03/25/03
LEAD, TOTAL	001 REP	S	03L0151	03/11/03	03/20/03	03/25/03
LEAD, TOTAL	001 MS	S	03L0151	03/11/03	03/20/03	03/25/03
SELENIUM, TOTAL	001	S	03L0151	03/11/03	03/20/03	03/25/03
SELENIUM, TOTAL	001 REP	S	03L0151	03/11/03	03/20/03	03/25/03
SELENIUM, TOTAL	001 MS	S	03L0151	03/11/03	03/20/03	03/25/03
VANADIUM, TOTAL	001	S	03L0151	03/11/03	03/20/03	03/25/03
VANADIUM, TOTAL	001 REP	S	03L0151	03/11/03	03/20/03	03/25/03

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-003 H2098

DATE RECEIVED: 03/13/03 LVL LOT # :0303L932

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
VANADIUM, TOTAL	001 MS	S	03L0151	03/11/03	03/20/03	03/25/03
ZINC, TOTAL	001	S	03L0151	03/11/03	03/20/03	03/25/03
ZINC, TOTAL	001 REP	S	03L0151	03/11/03	03/20/03	03/25/03
ZINC, TOTAL	001 MS	S	03L0151	03/11/03	03/20/03	03/25/03

LAB QC:

SILVER LABORATORY	LC1 BS	S	03L0151	N/A	03/20/03	03/22/03
SILVER, TOTAL	MB1	S	03L0151	N/A	03/20/03	03/22/03
ARSENIC LABORATORY	LC1 BS	S	03L0151	N/A	03/20/03	03/22/03
ARSENIC, TOTAL	MB1	S	03L0151	N/A	03/20/03	03/22/03
BARIUM LABORATORY	LC1 BS	S	03L0151	N/A	03/20/03	03/22/03
BARIUM, TOTAL	MB1	S	03L0151	N/A	03/20/03	03/22/03
BERYLLIUM LABORATORY	LC1 BS	S	03L0151	N/A	03/20/03	03/22/03
BERYLLIUM, TOTAL	MB1	S	03L0151	N/A	03/20/03	03/22/03
CADMIUM LABORATORY	LC1 BS	S	03L0151	N/A	03/20/03	03/22/03
CADMIUM, TOTAL	MB1	S	03L0151	N/A	03/20/03	03/22/03
CHROMIUM LABORATORY	LC1 BS	S	03L0151	N/A	03/20/03	03/22/03
CHROMIUM, TOTAL	MB1	S	03L0151	N/A	03/20/03	03/22/03
COPPER LABORATORY	LC1 BS	S	03L0151	N/A	03/20/03	03/22/03
COPPER, TOTAL	MB1	S	03L0151	N/A	03/20/03	03/22/03
MERCURY LABORATORY	LC1 BS	S	03C0058	N/A	03/24/03	03/24/03
MERCURY, TOTAL	MB1	S	03C0058	N/A	03/24/03	03/24/03
NICKEL LABORATORY	LC1 BS	S	03L0151	N/A	03/20/03	03/22/03
NICKEL, TOTAL	MB1	S	03L0151	N/A	03/20/03	03/22/03
LEAD LABORATORY	LC1 BS	S	03L0151	N/A	03/20/03	03/22/03
LEAD, TOTAL	MB1	S	03L0151	N/A	03/20/03	03/22/03
SELENIUM LABORATORY	LC1 BS	S	03L0151	N/A	03/20/03	03/22/03
SELENIUM, TOTAL	MB1	S	03L0151	N/A	03/20/03	03/22/03
VANADIUM LABORATORY	LC1 BS	S	03L0151	N/A	03/20/03	03/22/03
VANADIUM, TOTAL	MB1	S	03L0151	N/A	03/20/03	03/22/03
ZINC LABORATORY	LC1 BS	S	03L0151	N/A	03/20/03	03/22/03
ZINC, TOTAL	MB1	S	03L0151	N/A	03/20/03	03/22/03

Client: TNU-HANFORD F03-003
LVL#: 0303L932
SDG/SAF#: H2098/F03-003

W.O.#: 11343-606-001-9999-00
Date Received: 03-13-03

METALS CASE NARRATIVE

1. This narrative covers the analyses of 1 soil sample.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.

3. All analyses were performed within the required holding times.

4. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).

7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.

10. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.

11. All duplicate analyses were within the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

12. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in

a region of less-certain quantification.

13. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

03-31-03
Date

jjw/m03-932

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Lot#: 0303L932

Leaching Procedure: __1310 __1311 __1312 __Other:_____

CLP Metals __ Digestion and __ Analysis Methods: __ILM03.0 __ILM04.0

Metals Digestion Methods: __3005A __3010A __3015 __3020A X3050B __3051 __200.7 __SS17
__Other: _____

Metals Analysis Methods

	SW846		EPA		STD MTD	EPA OSWR	USATHAMA
Aluminum	X6010B		X200.7				X99
Antimony	X6010B	X7041 [5]	X200.7	X204.2			X99
Arsenic	X6010B	X7060A [5]	X200.7	X206.2	X3113B		X99
Barium	X6010B		X200.7				X99
Beryllium	X6010B		X200.7				X99
Bismuth	X6010B [1]		X200.7 [1]			X1620	X99
Boron	X6010B		X200.7				X99
Cadmium	X6010B	X7131A [5]	X200.7	X213.2			X99
Calcium	X6010B		X200.7				X99
Chromium	X6010B	X7191 [5]	X200.7	X218.2			XSS17
Cobalt	X6010B		X200.7				X99
Copper	X6010B	X7211 [5]	X200.7	X220.2			X99
Iron	X6010B		X200.7				X99
Lead	X6010B	X7421 [5]	X200.7	X239.2	X3113B		X99
Lithium	X6010B	X7430 [4]	X200.7			X1620	X99
Magnesium	X6010B		X200.7				X99
Manganese	X6010B		X200.7				X99
Mercury	X7470A [3]	X7471A [3]	X245.1 [2]	X245.5 [2]			X99
Molybdenum	X6010B		X200.7				X99
Nickel	X6010B		X200.7				X99
Potassium	X6010B	X7610 [4]	X200.7	X258.1 [4]			X99
Rare Earths	X6010B [1]		X200.7 [1]			X1620	X99
Selenium	X6010B	X7740 [5]	X200.7	X270.2	X3113B		X99
Silicon	X6010B [1]		X200.7			X1620	X99
Silica	X6010B		X200.7			X1620	X99
Silver	X6010B	X7761 [5]	X200.7	X272.2			X99
Sodium	X6010B	X7770 [4]	X200.7	X273.1 [4]			X99
Strontium	X6010B		X200.7				X99
Thallium	X6010B	X7841 [5]	X200.7	X279.2	X200.9		X99
Tin	X6010B		X200.7				X99
Titanium	X6010B		X200.7				X99
Uranium	X6010B [1]		X200.7 [1]			X1620	X99
Vanadium	X6010B		X200.7				X99
Zinc	X6010B		X200.7				X99
Zirconium	X6010B [1]		X200.7 [1]			X1620	X99

Other:_____ **Method:**_____

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LCS = Laboratory Control Sample.
NC = Not calculated.

ANALYTICAL METAL METHODS

1. Not included in the method element list.

2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, approximately 0.3 grams of sample is taken to a final volume of 50 mL (including all reagents).

3. Flame AA.

4. Graphite Furnace AA.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 03/28/03

CLIENT: TNUHANFORD F03-003 H2098

LVL LOT #: 0303L932

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B16541	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	6.4	MG/KG	0.31	1.0
		Barium, Total	77.8	MG/KG	0.009	1.0
		Beryllium, Total	0.35	MG/KG	0.009	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	16.5	MG/KG	0.05	1.0
		Copper, Total	12.0	MG/KG	0.05	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Nickel, Total	14.4	MG/KG	0.16	1.0
		Lead, Total	6.4	MG/KG	0.23	1.0
		Selenium, Total	0.32 u	MG/KG	0.32	1.0
		Vanadium, Total	34.4	MG/KG	0.009	1.0
		Zinc, Total	42.3	MG/KG	0.12	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 03/28/03

CLIENT: TNUHANFORD F03-003 H2098 LVL LOT #: 0303L932

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	03L0151-MB1	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	0.35 u	MG/KG	0.35	1.0
		Barium, Total	0.05	MG/KG	0.01	1.0
		Beryllium, Total	0.01 u	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	0.09	MG/KG	0.06	1.0
		Copper, Total	0.15	MG/KG	0.06	1.0
		Nickel, Total	0.18 u	MG/KG	0.18	1.0
		Lead, Total	0.26 u	MG/KG	0.26	1.0
		Selenium, Total	0.36 u	MG/KG	0.36	1.0
		Vanadium, Total	0.02	MG/KG	0.01	1.0
		Zinc, Total	1.1	MG/KG	0.14	1.0
BLANK1	03C0058-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 03/28/03

CLIENT: TNUHANFORD F03-003 H2098 LVL LOT #: 0303L932

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B16541	Silver, Total	4.4	0.07u	4.6	95.7	1.0
		Arsenic, Total	181	6.4	185	94.4	1.0
		Barium, Total	260	77.8	185	98.5	1.0
		Beryllium, Total	4.8	0.35	4.6	95.0	1.0
		Cadmium, Total	4.3	0.04u	4.6	93.3	1.0
		Chromium, Total	34.2	16.5	18.5	95.2	1.0
		Copper, Total	35.3	12.0	23.2	100.6	1.0
		Mercury, Total	0.19	0.02u	0.17	108.7	1.0
		Nickel, Total	57.9	14.4	46.4	93.9	1.0
		Lead, Total	50.0	6.4	46.4	94.2	1.0
		Selenium, Total	175	0.32u	185	94.2	1.0
		Vanadium, Total	81.0	34.4	46.4	100.6	1.0
		Zinc, Total	84.6	42.3	46.4	91.3	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 03/28/03

CLIENT: TNUHANFORD F03-003 H2098 LVL LOT #: 0303L932

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B16541	Silver, Total	0.07u	0.08u	NC	1.0
		Arsenic, Total	6.4	6.9	7.5	1.0
		Barium, Total	77.8	82.3	5.6	1.0
		Beryllium, Total	0.35	0.40	13.5	1.0
		Cadmium, Total	0.04u	0.04u	NC	1.0
		Chromium, Total	16.5	17.6	6.5	1.0
		Copper, Total	12.0	12.1	0.83	1.0
		Mercury, Total	0.02u	0.01u	NC	1.0
		Nickel, Total	14.4	15.7	8.6	1.0
		Lead, Total	6.4	7.2	11.8	1.0
		Selenium, Total	0.32u	0.35u	NC	1.0
		Vanadium, Total	34.4	37.5	8.6	1.0
		Zinc, Total	42.3	45.2	6.6	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 03/28/03

CLIENT: TNUHANFORD F03-003 H2098 LVL LOT #: 0303L932

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	03L0151-LC1	Silver, LCS	50.5	50.0	MG/KG	101.0
		Arsenic, LCS	989	1000	MG/KG	98.9
		Barium, LCS	486	500	MG/KG	97.3
		Beryllium, LCS	24.6	25.0	MG/KG	98.4
		Cadmium, LCS	25.6	25.0	MG/KG	102.4
		Chromium, LCS	51.8	50.0	MG/KG	103.6
		Copper, LCS	125	125	MG/KG	100
		Nickel, LCS	202	200	MG/KG	101.0
		Lead, LCS	252	250	MG/KG	101.0
		Selenium, LCS	968	1000	MG/KG	96.8
		Vanadium, LCS	258	250	MG/KG	103.0
		Zinc, LCS	102	100	MG/KG	101.5
LCS1	03C0058-LC1	Mercury, LCS	7.1	6.2	MG/KG	113.6

Lionville Laboratory Use Only

03031932

Custody Transfer Record/Lab Work Request

Page 1 of 1

LVLI LIONVILLE LABORATORY INC.

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU- HANFORD SAF# F03-003

Est. Final Proj. Sampling Date:

Project #: 11343-606-001-9999.00

Project Contact/Phone #:

Lionville Laboratory Project Manager: OJ

QC: SPEC Del: STD TAT: 30 days

Date Rec'd: 3-13-03 Date Due: 4-12-03

	A	B	C		D			E		F	G
Refrigerator #	1	6	6		6			6		6	6
#/Type Container – Liquid											
#/Type Container – Solid	1AG	1AG	1AG		1AG			1AG		1AG	1AG
Volume – Liquid											
Volume – Solid	250	250	250		250			250		500	60
Preservatives	—	—	—		—			—		—	—
ANALYSES REQUESTED	ORGANIC: TCL VOA	BNA	Pest/PCB	Herb	ALK Glycol Ketone			INORG: TCP Metal	CN	IC Anions	PH
Lionville Laboratory Use Only	0624H	0625X ODRO	OPCD		OGCSC			ZCEG MET①		INORG①	IPH

MATRIX CODES: S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - EP/TCLP Leachate; WI - Wipe; X - Other; F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb	ALK Glycol Ketone			Metal	CN	IC Anions	PH
001	B16541	✓	✓	S	3-11-03	1045	1	1	1		1			1	~~1~~	1	1

Special Instructions: SAF # F03-003

DATE/REVISIONS:

MET ① 1. As, Ba, Cd, Cr, Pb, Se, Ag, Be, Cu, Ni, V, Zn, Hg

INORG ① 2. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4, IN3N2,

3. INH3N, ICNTO, ISFD

4.

5.

6.

Lionville Laboratory Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___ Airbill # See Below

2) Ambient or (Chilled)

3) Received in Good Condition (Y) or N

4) Samples Properly Preserved (Y) or N

5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N

COC Record Present Upon Sample Rec't (Y) or N

Cooler Temp. 1.3 °C

Relinquished by	Received by	Date	Time
[signature]	[signature]	3/13/03	0955

Relinquished by	Received by	Date	Time
COMPOSITE WASTE		ORIGINAL REWRITTEN	

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES: 7902 2902 3746

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-003-155	Page 1 of 1

Collector Fahlberg/Johansen/Thomas	**Company Contact** CS Cearlock **Telephone No.** 373-3922	**Project Coordinator** TRENT, SJ	**Price Code** 8N **Data Turnaround** 45 Days
Project Designation 200 Area Source Characterization 200-CS-1 OU - Soil Sampl	**Sampling Location** Borehole B8828 (100-102 ft)	**SAF No.** F03-003	**Air Quality** ☐
Ice Chest No. ERC 01-025	**Field Logbook No.** HNF-N-3251 / **COA** tms 3-6-03 ~~117514ES10~~ 118322ES10	**Method of Shipment** Federal Express	
Shipped To ~~EBERLINE SERVICES (Formerly TMA)~~ RECRA	**Offsite Property No.** A030 164	**Bill of Lading/Air Bill No.** 7902 2902 3746	

POSSIBLE SAMPLE HAZARDS/REMARKS
Radioactive
Tie To B15XM1

Special Handling and/or Storage
Cool 4°C

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None	None	
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG	aG	
No. of Container(s)	1	1	1	1	1	1	1	1	1	
Volume	250mL	250mL	250mL	250mL	500mL	500mL	~~125mL~~ 60mL mo3-7-03	1000mL	125mL	
SAMPLE ANALYSIS	VOA - 8260A (TCL)	See item (1) in Special Instructions.	Alcohols, Glycols, & Ketones - 8015M (Add-on) {1-Propanol, Ethanol}	PCBs - 8082	See item (2) in Special Instructions.	See item (3) in Special Instructions.	pH (Soil) - 9045	See item (4) in Special Instructions.	Nickel-63; Technetium-99; Tritium - H3	

(Columns for item (4) and Nickel-63/Technetium-99/Tritium lined out: tmo 3/6/03)

Sample No.	Matrix *	Sample Date	Sample Time										
B16541	SOIL	3-11-03	1045	X	X	X	X	X	X	X			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
FH — [signature]	3/11/03 1230	ERC — R.Fahlberg R.Fahlberg	3/11/03 1230
R.Fahlberg R.Fahlberg	3·11·03 1230	3B 3728	3·11·03 1230
3B 3728	1000 3·12·03	R.Fahlberg R.Fahlberg	3·12·03 1000
ERC — R.Fahlberg R.Fahlberg	3·12·03 1000	Fed Ex	
FedEx	3-13-03 0955	[signature]	3-13-03 0955

SPECIAL INSTRUCTIONS
Lab reports Decane as a TIC if detectable, and report diesel and kerosene range compounds from WTPH-D analysis. FH acknowledges that the holding time for Nitrate by EPA 300.0 or 9056 will not be met. Analyze pH within 24 hr of receipt.

(1) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(3) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; NO2/NO3 - 353.2; Ammonia - 350.3; Total Cyanide - 9010; Sulfides - 9030
~~(4) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Isotopic Uranium, Americium-241, Neptunium-237, Strontium-89,90 -- Total Sr, Total Uranium~~ tmo 3/6/03

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

CLIENT: HANFORD

Purchase Order/Project:

DATE: 3-13-03

SAF# / SOW# / Release #: F03-003

Laboratory SDG #: 0303L932

NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1.	Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2.	Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3.	Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5.	Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6.	Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7.	All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8.	All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
10.	Shipment meets LvLl Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
11.	Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12.	coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13.	coc will be faxed or emailed to client?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
14.	Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☐ N/A	☐ see Comment #

Cooler # / temp (°C) and Comments:

RC-01-025 1-3°

Laboratory Sample Custodian:

Laboratory Project Manager:

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-003 H2098

DATE RECEIVED: 03/13/03 LVL LOT # :0303L932

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B16541						
% SOLIDS	001	S	03L%S034	03/11/03	03/17/03	03/18/03
% SOLIDS	001 REP	S	03L%S034	03/11/03	03/17/03	03/18/03
CHLORIDE BY IC	001	S	03LICC17	03/11/03	03/19/03	03/19/03
CHLORIDE BY IC	001 REP	S	03LICC17	03/11/03	03/19/03	03/19/03
CHLORIDE BY IC	001 MS	S	03LICC17	03/11/03	03/19/03	03/19/03
FLUORIDE BY IC	001	S	03LICC17	03/11/03	03/19/03	03/19/03
FLUORIDE BY IC	001 REP	S	03LICC17	03/11/03	03/19/03	03/19/03
FLUORIDE BY IC	001 MS	S	03LICC17	03/11/03	03/19/03	03/19/03
NITRITE BY IC	001	S	03LICC17	03/11/03	03/19/03	03/19/03
NITRITE BY IC	001 REP	S	03LICC17	03/11/03	03/19/03	03/19/03
NITRITE BY IC	001 MS	S	03LICC17	03/11/03	03/19/03	03/19/03
NITRATE BY IC	001	S	03LICC17	03/11/03	03/19/03	03/19/03
NITRATE BY IC	001 REP	S	03LICC17	03/11/03	03/19/03	03/19/03
NITRATE BY IC	001 MS	S	03LICC17	03/11/03	03/19/03	03/19/03
TOTAL CYANIDE	001	S	03LCA27	03/11/03	03/19/03	03/19/03
TOTAL CYANIDE	001 REP	S	03LCA27	03/11/03	03/19/03	03/19/03
TOTAL CYANIDE	001 MS	S	03LCA27	03/11/03	03/19/03	03/19/03
PHOSPHATE BY IC	001	S	03LICC17	03/11/03	03/19/03	03/19/03
PHOSPHATE BY IC	001 REP	S	03LICC17	03/11/03	03/19/03	03/19/03
PHOSPHATE BY IC	001 MS	S	03LICC17	03/11/03	03/19/03	03/19/03
CHROMIUM VI	001	S	03LVI014	03/11/03	03/17/03	03/17/03
CHROMIUM VI	001 REP	S	03LVI014	03/11/03	03/17/03	03/17/03
CHROMIUM VI	001 MS	S	03LVI014	03/11/03	03/17/03	03/17/03
CHROMIUM VI	001 MSD	S	03LVI014	03/11/03	03/17/03	03/17/03
SULFATE BY IC	001	S	03LICC17	03/11/03	03/19/03	03/19/03
SULFATE BY IC	001 REP	S	03LICC17	03/11/03	03/19/03	03/19/03
SULFATE BY IC	001 MS	S	03LICC17	03/11/03	03/19/03	03/19/03
NITRATE NITRITE	001	S	03LN3C17	03/11/03	03/18/03	03/18/03
NITRATE NITRITE	001 REP	S	03LN3C17	03/11/03	03/18/03	03/18/03
NITRATE NITRITE	001 MS	S	03LN3C17	03/11/03	03/18/03	03/18/03
AMMONIA	001	S	03LAMA10	03/11/03	04/03/03	04/03/03
AMMONIA	001 REP	S	03LAMA10	03/11/03	04/03/03	04/03/03
AMMONIA	001 MS	S	03LAMA10	03/11/03	04/03/03	04/03/03
PH	001	S	03LPH020	03/11/03	03/14/03	03/14/03
PH	001 REP	S	03LPH020	03/11/03	03/14/03	03/14/03

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-003 H2098

DATE RECEIVED: 03/13/03 LVL LOT # :0303L932

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SULFIDE	001	S	03LSD010	03/11/03	03/18/03	03/20/03
SULFIDE	001 REP	S	03LSD010	03/11/03	03/18/03	03/20/03
SULFIDE	001 MS	S	03LSD010	03/11/03	03/18/03	03/20/03

LAB QC:

CHLORIDE BY IC	MB1	S	03LICC17	N/A	03/19/03	03/19/03
CHLORIDE BY IC	MB1 BS	S	03LICC17	N/A	03/19/03	03/19/03
FLUORIDE BY IC	MB1	S	03LICC17	N/A	03/19/03	03/19/03
FLUORIDE BY IC	MB1 BS	S	03LICC17	N/A	03/19/03	03/19/03
NITRITE BY IC	MB1	S	03LICC17	N/A	03/19/03	03/19/03
NITRITE BY IC	MB1 BS	S	03LICC17	N/A	03/19/03	03/19/03
NITRATE BY IC	MB1	S	03LICC17	N/A	03/19/03	03/19/03
NITRATE BY IC	MB1 BS	S	03LICC17	N/A	03/19/03	03/19/03
TOTAL CYANIDE	LCS L	S	03LCA27	N/A	03/19/03	03/19/03
TOTAL CYANIDE	LCS L	S	03LCA27	N/A	03/19/03	03/19/03
TOTAL CYANIDE	MB1	S	03LCA27	N/A	03/19/03	03/19/03
PHOSPHATE BY IC	MB1	S	03LICC17	N/A	03/19/03	03/19/03
PHOSPHATE BY IC	MB1 BS	S	03LICC17	N/A	03/19/03	03/19/03
CHROMIUM VI	MB1	S	03LVI014	N/A	03/17/03	03/17/03
CHROMIUM VI	MB1 BS	S	03LVI014	N/A	03/17/03	03/17/03
CHROMIUM VI	MB1 BSD	S	03LVI014	N/A	03/17/03	03/17/03
SULFATE BY IC	MB1	S	03LICC17	N/A	03/19/03	03/19/03
SULFATE BY IC	MB1 BS	S	03LICC17	N/A	03/19/03	03/19/03
NITRATE NITRITE	MB1	S	03LN3C17	N/A	03/18/03	03/18/03
NITRATE NITRITE	MB1 BS	S	03LN3C17	N/A	03/18/03	03/18/03
AMMONIA	MB1	S	03LAMA10	N/A	04/03/03	04/03/03
AMMONIA	MB1 BS	S	03LAMA10	N/A	04/03/03	04/03/03
AMMONIA	MB1 BSD	S	03LAMA10	N/A	04/03/03	04/03/03
SULFIDE	MB1	S	03LSD010	N/A	03/18/03	03/20/03
SULFIDE	MB1 BS	S	03LSD010	N/A	03/18/03	03/20/03

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD F03-003 H2098
LVL#: 0303L932

W.O.#: 11343-606-001-9999-00
Date Received: 03-13-03

INORGANIC NARRATIVE

1. This narrative covers the analyses of 1 soil sample.

2. The sample was prepared and analyzed in accordance with the methods indicated on the attached glossary.

3. Sample holding times as required by the method and/or contract were met.

4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy.

5. The method blanks were within the method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS for Ammonia was within the 20% Relative Percent Difference (RPD) control limit.

7. The matrix spike (MS) recoveries for Chloride, Fluoride, Nitrite, Nitrate, Total Cyanide, Phosphate, Chromium VI, Sulfate, Nitrate Nitrite, Ammonia and Sulfide were within the 75-125% control limits.

8. The replicate analyses for Percent Solids, Chloride, Fluoride, Nitrite, Nitrate, Total Cyanide Phosphate, Chromium VI, Sulfate, Nitrate Nitrite, Ammonia, pH and Sulfide were within the 20% Relative Percent Difference (RPD) control limit.

9. Results for solid samples are reported on a dry weight basis.

10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

04-07-03
Date

njp\i03-932

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 14 pages.

03

Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	ASTM	SW846	OTHER
% Ash	__ D2216-80		
% Moisture	__ D2216-80		__ ILMO4.0 (e)
% Solids	✓ D2216-80		__ ILMO4.0 (e)
% Volatile Solids	__ D2216-80		
ASTM Extraction in Water	__ D3987-81/85		
BTU	__ D240-87		
CEC		__ 9081	__ c
Chromium VI		✓ 3060A/7196A	
Corrosivity ___ by coupon ___ by pH		__ 1110(mod) __ 9045C	
Cyanide, Total		✓ 9010B/9014	__ ILMO4.0 (e)
Cyanide, Reactive		__ Section 7.3/9014	
Halides, Extractable Organic		__ 9020B	__ EPA 600/4/84-008
Halides, Total		__ 9020B	__ EPA 600/4/84-008
EP Toxicity		__ 1310A	
Flash Point		__ 1010	
Ignitability		__ 1010	
Oil & Grease		__ 9071A	
Carbon, Total Organic		__ 9060	__ Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions	__ D240-87(mod)	__ 5050	
Petroleum Hydrocarbons, Total Recoverable		__ 9071	__ EPA 418.1
pH, Soil		✓ 9045C	
Sulfide, Reactive		__ Section 7.3/9030B	
Sulfide		✓ 9030B(mod)	
Specific Gravity	__ D1429-76C/	__ D5057-90	
Sulfur, Total		__ 9056	
Synthetic Preparation Leach		__ 1312	
Paint Filter		__ 9095A	
Other: Chloride, Fluoride, Nitrite,		**Method:** EPA 300.0 (mod.)	
Other: Nitrate, Phosphate, Sulfate		**Method**	

Nitrate Nitrite EPA 353.2 (mod.)

Ammonia EPA 350.3

Lionville Laboratory Incorporated

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LC = Laboratory Control Sample.
NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).

3. Test Methods for Evaluating Solid Waste (USEPA SW-846).

a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).

b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).

c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).

d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).

e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.

f. Code of Federal Regulations.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/04/03

CLIENT: TNUHANFORD F03-003 H2098 LVL LOT #: 0303L932

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B16541	% Solids	96.3		%	0.01	1.0
		Chloride by IC	2.0		MG/KG	1.3	1.0
		Fluoride by IC	1.3	u	MG/KG	1.3	1.0
		Nitrite by IC	1.30	u	MG/KG	1.30	1.0
		Nitrate by IC	1.30	u	MG/KG	1.30	1.0
		Cyanide, Total	0.48	u	MG/KG	0.48	1.0
		Phosphate by IC	1.3	u	MG/KG	1.3	1.0
		Chromium VI	0.42	u	MG/KG	0.42	1.0
		Sulfate by IC	3.0		MG/KG	1.3	1.0
		Nitrate Nitrite	0.18	u	MG/KG	0.18	1.0
		Ammonia, as N	4.4	u	MG/KG	4.4	1.0
		pH	9.2		SOIL PH	0.01	1.0
		Sulfide	28.1	u	MG/KG	28.1	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 04/04/03

CLIENT: TNUHANFORD F03-003 H2098 LVL LOT #: 0303L932
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	03LICC17-MB1	Chloride by IC	1.2 u	MG/KG	1.2	1.0
		Fluoride by IC	1.2 u	MG/KG	1.2	1.0
		Nitrite by IC	1.25 u	MG/KG	1.25	1.0
		Nitrate by IC	1.25 u	MG/KG	1.25	1.0
		Phosphate by IC	1.2 u	MG/KG	1.2	1.0
		Sulfate by IC	1.2 u	MG/KG	1.2	1.0
BLANK1	03LCA27-MB1	Cyanide, Total	0.50 u	MG/KG	0.50	1.0
BLANK10	03LVI014-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0
BLANK10	03LN3C17-MB1	Nitrate Nitrite	0.20 u	MG/KG	0.20	1.0
BLANK10	03LAMA10-MB1	Ammonia, as N	5.0 u	MG/KG	5.0	1.0
BLANK10	03LSD010-MB1	Sulfide	40.0 u	MG/KG	40.0	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 04/04/03

CLIENT: TNUHANFORD F03-003 H2098 LVL LOT #: 0303L932

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B16541	Chloride by IC	26.6	2.0	26.0	94.7	1.0
		Fluoride by IC	26.9	0.0	26.0	103.6	1.0
		Nitrite by IC	25.6	1.30u	26.0	98.6	1.0
		Nitrate by IC	25.3	1.30u	26.0	97.2	1.0
		Cyanide, Total	4.32	0.48u	4.37	99.0	1.0
		Phosphate by IC	27.5	1.3 u	26.0	105.8	1.0
		Soluble Chromium VI	4.2	0.42u	4.2	96.8	1.0
		Insoluble Chromium VI	1410	0.42u	1180	120.1	100
		Sulfate by IC	28.5	3.0	26.0	98.1	1.0
		Nitrate Nitrite	6.8	0.18u	6.9	98.6	1.0
		Ammonia, as N	157	4.4 u	152	103.5	1.0
		Sulfide	212	4.2	225	92.4	1.0
BLANK10	03LICC17-MB1	Chloride by IC	24.2	1.2 u	25.0	96.9	1.0
		Fluoride by IC	24.7	1.2 u	25.0	98.8	1.0
		Nitrite by IC	24.0	1.25u	25.0	95.9	1.0
		Nitrate by IC	23.9	1.25u	25.0	95.7	1.0
		Phosphate by IC	26.3	1.2 u	25.0	105.3	1.0
		Sulfate by IC	24.1	1.2 u	25.0	96.4	1.0
BLANK10	03LVI014-MB1	Soluble Chromium VI	4.0	0.40u	4.0	98.9	1.0
		Insoluble Chromium VI	1260	0.40u	1110	113.5	100
BLANK10	03LN3C17-MB1	Nitrate Nitrite	5.0	0.20u	5.0	101.0	1.0
BLANK10	03LAMA10-MB1	Ammonia, as N	204	5.0 u	200	101.8	1.0
		Ammonia, as N MSD	196	5.0 u	200	98.0	1.0
BLANK10	03LSD010-MB1	Sulfide	371	40.0 u	394	94.2	1.0

Lionville Laboratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 04/04/03

CLIENT: TNUHANFORD F03-003 H2098 LVL LOT #: 0303L932

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
BLANK10	03LAMA10-MB1	Ammonia, as N	101.8	98.0	3.8

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 04/04/03

CLIENT: TNUHANFORD F03-003 H2098 LVL LOT #: 0303L932

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B16541	% Solids	96.3	96.1	0.20	1.0
		Chloride by IC	2.0	2.4	15.4	1.0
		Fluoride by IC	1.3 u	1.3 u	NC	1.0
		Nitrite by IC	1.30u	1.30u	NC	1.0
		Nitrate by IC	1.30u	1.30u	NC	1.0
		Cyanide, Total	0.48u	0.42u	NC	1.0
		Phosphate by IC	1.3 u	1.3 u	NC	1.0
		Chromium VI	0.42u	0.42u	NC	1.0
		Sulfate by IC	3.0	3.0	1.5	1.0
		Nitrate Nitrite	0.18u	0.22u	NC	1.0
		Ammonia, as N	4.4 u	4.2 u	NC	1.0
		pH	9.2	9.2	0.3	1.0
		Sulfide	28.1 u	25.5 u	NC	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 04/04/03

CLIENT: TNUHANFORD F03-003 H2098 LVL LOT #: 0303L932

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCSS1	03LCA27-LCS1	Cyanide, Total LCS	1.87	2.0	MG/KG	93.6
LCSS2	03LCA27-LCS2	Cyanide, Total LCS	9.84	10.0	MG/KG	98.4

Lionville Laboratory Use Only

03031932

Custody Transfer Record/Lab Work Request

Page 1 of 1

LVLI LIONVILLE LABORATORY INC.

12

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client TNU - HANFORD SAF# F03-003

Est. Final Proj. Sampling Date

Project # 1343-606-001-9999-00

Project Contact/Phone #

Lionville Laboratory Project Manager OJ

QC SPEC Del STD TAT 30 days

Date Rec'd 3-13-03 Date Due 4-12-03

		A	B	C		D			E		F	G				
Refrigerator #		1	6	6		6			6		6	6				
#/Type Container	Liquid															
	Solid	1AG	1AG	1AG		1AG			1AG		1AG	1AG				
Volume	Liquid															
	Solid	250	250	250		250			250		500	60				
Preservatives		—	—	—		—			—		—	—				
ANALYSES REQUESTED →		ORGANIC				ALK Glycol Methods			INORG							
		TCL VOA	BNA	PCB/ Pest	Herb				TCLP Metal	CN	IC Anions	PH				
		Lionville Laboratory Use Only														
		0624 H	0625 x ODRO	OPCD		OGCSC			ICAP MET ①		INORG ①	IPH				

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected															
S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids L - EP/TCLP Leachate WI - Wipe X - Other F - Fish	001	B16541	✓	✓	S	3-11-03	1045	1	1	1		1		1		1	1				

Special Instructions: SAF # F03-003

DATE/REVISIONS:

MET ① 1. As, Ba, Cd, Cr, Pb, Se, Ag, Be, Cu, Ni, V, Zn, Hg

INORG ① 2. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4, IN3N2,

3. INH3N, ICNTO, ISFD

4.

5.

6.

Lionville Laboratory Use Only

Samples were: 1) Shipped / or Hand Delivered ___

Airbill # See Below

2) Ambient or (Chilled)

3) Received in Good Condition (Y) or N

4) Samples Properly Preserved (Y) or N

5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:

1) Present on Outer Package (Y) or N

2) Unbroken on Outer Package (Y) or N

3) Present on Sample (Y) or N

4) Unbroken on Sample (Y) or N

COC Record Present Upon Sample Rec't (Y) or N

Cooler Temp. 1-3 °C

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES: 790229023746

Relinquished by	Received by	Date	Time
Fed Ex	[signature]	3/13/03	0955

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-003-155	Page 1 of 1

Collector Fahlberg/Johansen/Thomas	**Company Contact** CS Cearlock	**Telephone No.** 373-3922	**Project Coordinator** TRENT, SJ	**Price Code** 8N	**Data Turnaround** 45 Days
Project Designation 200 Area Source Characterization 200-CS-1 OU - Soil Sampl	**Sampling Location** Borehole B8828 (100-102 ft)		**SAF No.** F03-003	**Air Quality** ☐	
Ice Chest No. FRC 01-025	**Field Logbook No.** HNF-N-3251	COA 118322610 ~~117514ES10~~ MS 3-6-03	**Method of Shipment** Federal Express		
Shipped To ~~EBERLINE SERVICES (Formerly TMA)~~ RECEIVING	**Offsite Property No.** A030164		**Bill of Lading/Air Bill No.** 7902 2902 3746		

POSSIBLE SAMPLE HAZARDS/REMARKS
Radioactive

T:<To 8315XM1

Special Handling and/or Storage
Cool 4°C

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None	None	
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG	aG	
No. of Container(s)	1	1	1	1	1	1	1 MS 3-6-03	1	1	
Volume	250mL	250mL	250mL	250mL	500mL	500mL	~~125mL~~ 60mL	1000mL	125mL	
SAMPLE ANALYSIS	VOA - 8260A (TCL)	See item (1) in Special Instructions.	Alcohols, Glycols, & Ketones - 8015M (Add-on) {1-Propanol, Ethanol}	PCBs - 8082	See item (2) in Special Instructions.	See item (3) in Special Instructions.	pH (Soil) - 9045	See item (4) in Special Instructions.	Nickel-63; Technetium-99; Tritium - H3	

Sample No.	Matrix *	Sample Date	Sample Time									
B16541	SOIL	3-11-03	1045	X	X	X	X	X	X	X		

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
ERC	3/11/03 1230	ERC	3/11/03 1230
R. Fahlberg	3-11-03 1230	3B 3728	3-11-03 1230
3B 3728	3-12-03 1000	R. Fahlberg	3-12-03 1000
ERC	3-12-03 1000	Fed Ex	
Fed Ex	3-13-03 0955		3-13-03 0955

SPECIAL INSTRUCTIONS
Lab reports Decane as a TIC if detectable, and report diesel and kerosene range compounds from WTPH-D analysis. FH acknowledges that the holding time for Nitrate by EPA 300.0 or 9056 will not be met. Analyze pH within 24 hr of receipt.

(1) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(3) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; NO2/NO3 - 353.2; Ammonia - 350.3; Total Cyanide - 9010; Sulfides - 9030
~~(4) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Isotopic Uranium; Americium-241; Neptunium-237; Strontium-89/90 -- Total Sr; Total Uranium~~

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Other
V=Vegetation
O=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

CLIENT: HANFORD

Purchase Order/Project:

DATE: 3-13-03

SAF# / SOW# / Release #: F03-063

Laboratory SDG #: 0303L932

NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1.	Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2.	Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3.	Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5.	Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6.	Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7.	All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8.	All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
10.	Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
11.	Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12.	coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13.	coc will be faxed or emailed to client?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
14.	Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☐ N/A	☐ see Comment #

Cooler # / temp (°C) and Comments:

IRC-01-025 1-3°

Laboratory Sample Custodian:

Laboratory Project Manager: